

Smart relays

Zelio Logic

Catalogue
November

05



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Simply Smart!

Leveraging
ingenuity
and intelligence
for **ease of use**

Smart relays

Zelio Logic

Extend your capabilities!

Designed for the management of simple automation system functions comprising 10 to 40 I/O, Zelio Logic smart relays are a competitive alternative to solutions based on cabled logic or specific cards.

Unrivalled in **flexibility**, Zelio Logic offers you the choice of 2 ranges (compact or modular) and real programming using LADDER or function block diagram (FBD) languages.

Simple to program and set-up, it also enables the control and monitoring of your applications remotely...

Now, the Zelio Logic range is extended in order to provide solutions that are better suited to your requirements and varying applications.



➤ New analogue I/O extension module (10 bits)

1 extension module with 4 configurable I/O:

- 1 input: 0...10 V or 0...20 mA
- 1 input: 0...10 V or 0...20 mA or Pt100
- 2 outputs: 0...10 V



➤ New accessories

EEPROM memory cartridge

Save and make a copy of your program with complete peace of mind

- Modify the language used (FBD, LADDER) on loading or transferring the application
- Configure the smart relay in the language of your choice

USB cable

- Reduce costs by using only 1 cable for direct connection to the Zelio Logic



➤ New Zelio Logic Modular for 12 VDC

One 26 I/O Zelio Logic Modular base:

- 16 inputs (including 6 analogue inputs)
- 10 relay outputs

Three I/O extension modules with relay outputs:

- 6 I/O (4 inputs/2 outputs)
- 10 I/O (6 inputs/4 outputs)
- 14 I/O (8 inputs/6 outputs)

Monitor and control your installations remotely!



With the **modem communication interface**, monitor and remotely control your unmanned installations and reduce your maintenance costs.

- Avoid unnecessary on-site visits
- Define your maintenance priorities
- Perform pre-diagnostics
- Manage your maintenance personnel

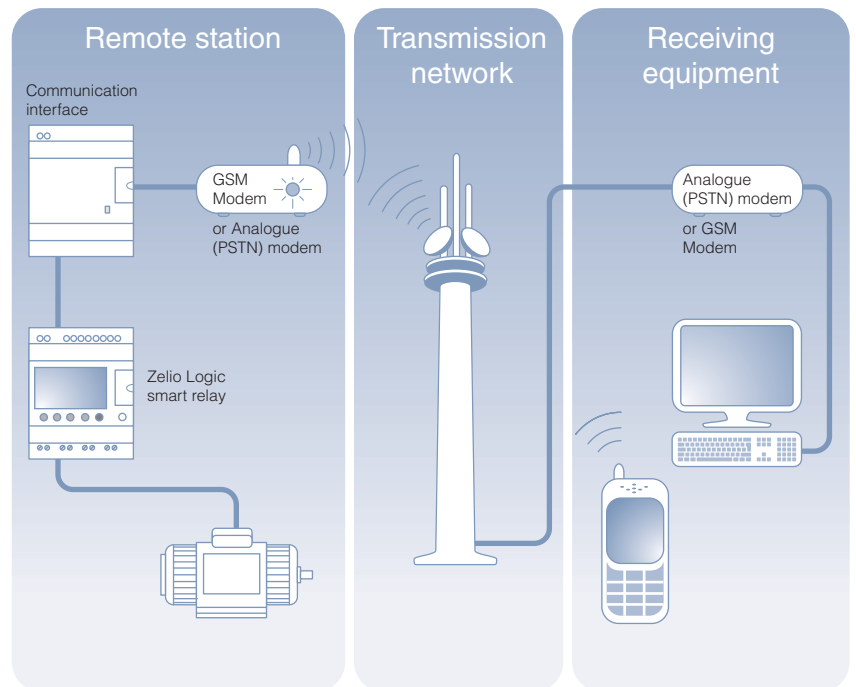


On-site with a **mobile phone**:

- Receive alert messages via SMS: in the event of the mobile phone being unavailable, the alert is automatically redirected to another telephone.
- Send instructions to a remote smart relay
- Obtain information regarding the status of the application components

In the office with **Zelio Logic Alarm** software

- Benefit from the same functions as those using your mobile phone within the comfort of a PC environment
- Manage the composition of your maintenance teams
- Easily organise your alarms: classify, archive, sort, export




With the **Modbus slave** communication module:

- Easily connect automation system equipment such as displays or PLCs...
- Remotely manage the specialised controls of the Zelio Logic smart relay: set to RUN/STOP, adjust the clock...

Zelio Logic smart relays

Compact and modular smart relays

Smart relay type	Compact smart relays			
				
Supply voltage	12 V	24 V	24 V	100...240 V
Number of I/O (maximum number of I/Os with extension modules)	12 and 20	10, 12 and 20	12 and 20	10, 12 and 20
Number of discrete inputs (including analogue inputs)	8 (4) and 12 (6)	6 (0), 8 (4), 12 (2) and 12 (6)	8 (0) and 12 (0)	6 (0), 8 (0) and 12 (0)
Number of “relay”/“transistor” outputs	4/0 and 8/0	4/0, 0/4, 8/0 and 0/8	4/0 and 8/0	
With display, with clock Programming language	SR2 B●●●●● FBD or LADDER			
With display, without clock Programming language	SR2 A●●●●● LADDER only		SR2 A●●●●● LADDER only	
Without display, with clock Programming language	SR2 E●●●●● FBD or LADDER			
Without display, without clock Programming language	SR2 D●●●●● LADDER only		SR2 D●●●●● LADDER only	
Analogue I/O extension modules (see page 21)				
Modbus network communication module (see page 31)				
Modem communication interface (see page 38)	SR2 COM01	SR2 COM01 (for SR2 B and SR2 E)	SR2 COM01	SR2 COM01 (for SR2 B and SR2 E)
EEPROM memory cartridge (see page 22)	SR2 MEM02 ⚠ incompatible with SR2 COM01			
“Zelio Soft 2” software (see page 22)	SR2 SFT01			
“Discovery” packs	SR2 PACK●BD (see page 20)		SR2 PACK●FU (see page 20)	
Converters (thermocouple types J and K, Pt100 probes and voltage/current) (see page 48)	RM●●●●BD			
Power supplies for d.c. control circuit (see page 53)	ABL 7RM1202	ABL 7RM240●●		
References	SR2 B●●●JD	SR2 ●●●●BD	SR2 ●●●●B	SR2 ●●●●FU
Page	20	20	20	20

(1) FBD: Function Block Diagram.

(1) FBD: Function Block Diagram.

Modular smart relays



— 12 V

— 24 V

~ 24 V

~ 100...240 V

26 (30, 32, 36 and 40)

10 (14, 16, 20 and 24) and 26 (30, 32, 36 and 40)

16 (6)

6 (4) and 16 (6)

6 (0) and 16 (0)

10/0

4/0, 0/4, 10/0 and 0/10

4/0 and 10/0

SR3 B●●●●●
FBD or LADDER

SR3 XT43BD

SR3 MBU01BD

SR2 COM01

SR3 PACK●BD
(see page 21)

SR3 PACK●FU
(see page 21)

RM●●●●BD

ABL 7RM1202

ABL 7RM240●●

SR3 B261JD

SR3 B●●●BD

SR3 B●●1B

SR3 B●●1FU


21

21

21

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(1) FBD: Function Block Diagram.

Product types	Discrete I/O extension modules			
				
Supply voltage	via SR3 B261JD (= 12 V)	via SR3 B...BD (= 24 V)	via SR3 B...1B (~ 24 V)	via SR3 B...1FU (~ 100...240 V)
Number and type of I/O	Discrete inputs/outputs: 6, 10 and 14			
Number and type of inputs	Discrete inputs: 4, 6 and 8			
Number and type of outputs	Relay outputs: 2, 4 and 6			
Programming software	"Zelio Soft 2" SR2 SFT01 (see page 22)			
Alarms management software				
References	SR3 XT...JD	SR3 XT...BD	SR3 XT...B	SR3 XT...FU
Page	21	21	21	21

Analogue I/O extension modules



via SR3 B●●●BD
(\approx 24 V)

Analogue inputs/outputs: 4

Analogue inputs: 2

0-10 V	0-20 V	Pt100
2	0	0
1	1	0
0	2	0
1	0	1
0	1	1

Analogue outputs 0-10 V: 2

Modbus network slave communication module



via SR3 B●●●BD
(\approx 24 V)

■ Number of words:

- ☐ 4 (inputs)
- ☐ 4 (outputs)
- ☐ 1 (status)

■ Maximum number of slaves: 32

■ Maximum number of slaves with repeaters: 247

Modbus communication interface



\approx 12...24 V

Functions

- alarm sending
- receipt of instruction
- remote dialogue with Zelio Soft 2

software:

- ☐ Transfer
- ☐ Monitoring
- ☐ Diagnostics

2 types of modem:

- analogue (PSTN) modem
- GSM modem

Power supplies for d.c. control circuit



\sim 100...240 V single-phase

Nominal output voltage.:

- \approx 12 V
- \approx 24 V

Nominal output current:

- 1.9 A (\approx 12 V)
- 1.3 A (\approx 24 V)
- 2.5 A (\approx 24 V)

"Zelio Logic Alarm" SR2 SFT02
(see page 38)

SR3 XT43BD

21

SR3 MBU01BD

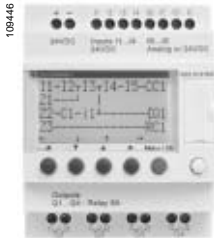
31

SR2 COM01

38

ABL 7RM●●●●●

53

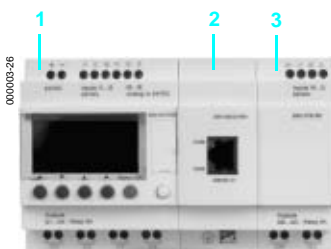


SR2 B121BD

Modular smart relay and extension module combination



- 1 Modular smart relay (10 or 26 I/O)
- 2 Discrete I/O (6, 10 or 14 I/O) or analogue I/O (4 I/O) extension module



- 1 Modular smart relay (10 or 26 I/O)
- 2 Network communication module
- 3 Discrete I/O (6, 10 or 14 I/O) or analogue I/O (4 I/O) extension module

▲ The order shown above must be observed when using a Modbus network slave communication module and a discrete or analogue I/O extension module. An I/O extension module cannot be fitted before the Modbus network slave communication module.

Presentation

Zelio Logic smart relays are designed for use in small automation systems. They are used in both the industrial and commercial sectors.

■ For industry:

- automation of small finishing, production, assembly or packaging machines.
- decentralised automation of ancillary equipment of large and medium-sized machines (textile, plastics, materials processing sectors, etc.)
- automation systems for agricultural machinery (irrigation, pumping, greenhouses, etc.).

■ For the commercial/building sectors:

- automation of barriers, roller shutters, access control,
- automation of lighting systems,
- automation of compressors and air conditioning systems.

Their compact size and ease of setting-up make them a competitive alternative to solutions based on cabled logic or specific cards.

■ Programming

Simple programming, ensured by the universal nature of the languages, meets all the requirements of automation specialists and also the needs of the electrician.

Programming can be performed:

- independently, using the buttons on the smart relay (ladder language),
- on a PC using "Zelio Soft 2" software.

When using a PC, programming can be performed either in LADDER language or in function block diagram (FBD) language, see pages 12 and 13.

Backlighting of the LCD display (1) is set by either using the 6 programming buttons on the smart relay or by using "Zelio Soft 2" software (example: flashing in the event of a malfunction).

The autonomous operating time of the clock, assured by a lithium battery, is 10 years.

Data backup (preset values and current values) is provided by an EEPROM Flash memory (10 years).

Compact smart relays

Compact smart relays meet requirements for simple automation systems.

The number of inputs/outputs can be:

- 12 or 20 I/O, supplied with ~ 12 V or ~ 24 V,
- 10, 12 or 20 I/O, supplied with ~ 24 V or $\sim 100...240$ V.

Modular smart relays and extensions

The number of inputs/outputs for modular smart relays can be:

- 26 I/O, supplied with ~ 12 V,
- 10 or 26 I/O, supplied with ~ 24 V, ~ 24 V or $\sim 100...240$ V.

To improve performance and flexibility, Zelio Logic modular smart relays can be fitted with I/O extension modules with from 10 to 40 I/O:

- discrete I/O extension modules with 6, 10 or 14 I/O, supplied via the smart relay at the same voltage,
- analogue I/O extension modules with 4 I/O, supplied with ~ 24 V via the smart relay at the same voltage,
- network communication module, supplied with ~ 24 V via the smart relay at the same voltage.

(1) LCD: Liquid Crystal Display.



SR2 MEM02

Memory cartridges

The Zelio Logic smart relay can be fitted with a backup memory cartridge which enables copying of the program into another smart relay for: loading and updating of on-board software (memory cartridge SR2 MEM02 only), building of identical equipment, remote transmission of updates).

These memory cartridges also enable a backup copy of the program to be saved prior to replacing the product.

When they are used with a smart relay without display or buttons, the copy of the program contained in the cartridge is automatically transferred into the smart relay on power-up.



Communication interface



Analogue PSTN modem



GSM modem

Modem communication interface

The "communication" products in the Zelio Logic range include:

- a Modem communication interface connected between a smart relay and a Modem, see pages 32 to 41,
- analogue (PSTN) (1) or GSM (2) Modems,
- "Zelio Logic Alarm" software.

They are designed for monitoring or remote control of machines or installations which operate without personnel.

The Modem communication interface supplied with $\pm 12...24$ V, enables messages, telephone numbers and calling conditions to be stored.

(1) Public Subscriber Telephone Network.

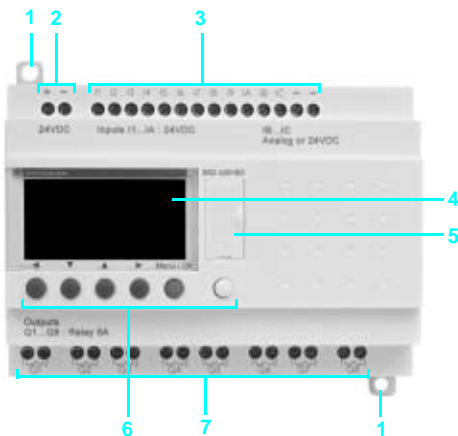
(2) Global System Mobile.

Zelio Logic smart relays

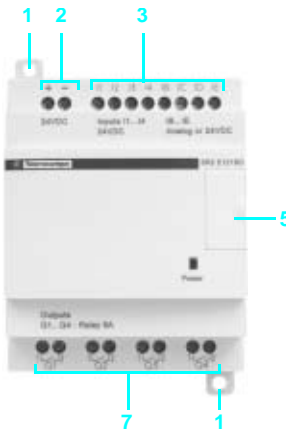
Compact and modular smart relays

Compact smart relays

With display - 10, 12 and 20 I/O



Without display - 10, 12 and 20 I/O

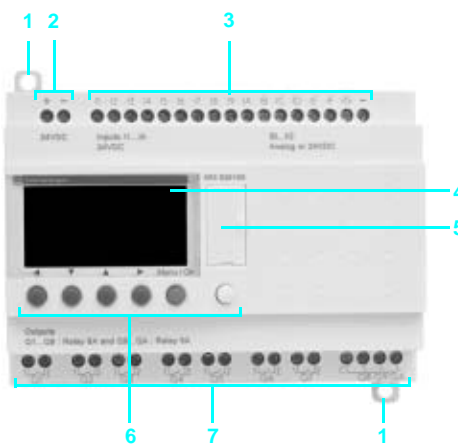


Compact smart relays have the following on the front face:

- 1 Two retractable fixing lugs.
- 2 Two power supply terminals.
- 3 Terminals for connection of the inputs.
- 4 Backlit LCD display with 4 lines of 18 characters.
- 5 Slot for memory cartridge or connection to a PC or communication interface.
- 6 6 buttons for programming and parameter entry.
- 7 Terminals for connection of the outputs.

Modular smart relays

With display - 10 and 26 I/O



Modular smart relays have the following on the front panel:

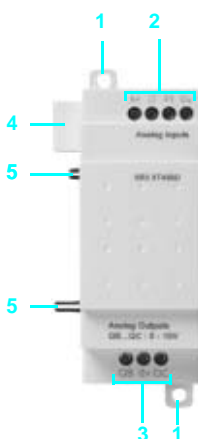
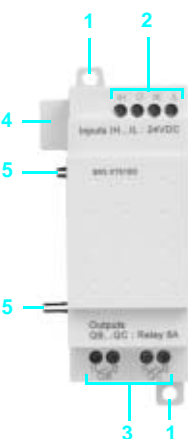
- 1 Two retractable fixing lugs.
- 2 Two power supply terminals.
- 3 Terminals for connection of the inputs.
- 4 Backlit LCD display with 4 lines of 18 characters.
- 5 Slot for memory cartridge or connection to a PC or communication interface.
- 6 6 buttons for programming and parameter entry.
- 7 Terminals for connection of the outputs.

Discrete and analogue I/O extension modules

6 discrete I/O

10 and 14 discrete I/O

4 analogue I/O



I/O extension modules have the following on the front face:

- 1 Two retractable fixing lugs.
- 2 Terminals for connection of the inputs.
- 3 Terminals for connection of the outputs.
- 4 A connector for connection to the smart relay (powered by the smart relay).
- 5 Locating pegs.

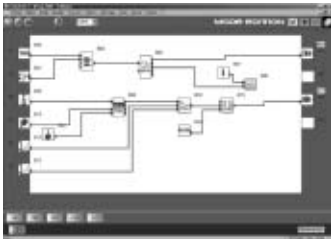
Zelio Logic smart relays

Compact and modular smart relays

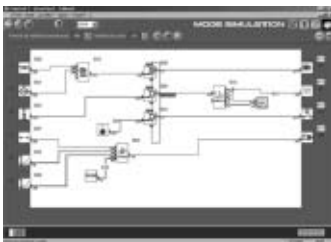
"Zelio Soft 2" programming software



Programming in LADDER language



Programming in FBD language



"Simulation" mode



"Monitoring" window

"Zelio Soft 2" for PC (versions 3.1 and above)

"Zelio Soft 2" software enables:

- programming in LADDER language or in function block diagram (FBD) language, see pages 12 and 13.
- simulation, monitoring and supervision,
- uploading and downloading of programs,
- output of personalised files,
- automatic compiling of programs,
- on-line help.

Coherence tests and application languages

"Zelio Soft 2" software monitors applications by means of its coherence test function. An indicator turns red at the slightest input error. The problem can be located by simply clicking the mouse.

"Zelio Soft 2" software allows switching, at any time, to any of the 6 languages (English, French, German, Spanish, Italian, Portuguese) and editing of the application file in the selected language.

Inputting messages for display on Zelio Logic

"Zelio Soft 2" software allows Text function blocks to be configured, which can then be displayed on all smart relays which have a display.

Program testing

2 test modes are provided:

- "Zelio Soft 2" **simulation** mode allows a program to be tested without a Zelio Logic smart relay, i.e.:
 - enable discrete inputs,
 - display the status of outputs,
 - vary the voltage of the analogue inputs,
 - enable the programming buttons,
 - simulate the application program in real time or in accelerated time,
 - dynamically display (in red) the various active elements of the program.
- "Zelio Soft 2" **monitoring** mode makes it possible to test the program executed by the smart relay, i.e.:
 - display the program "on-line",
 - force inputs, outputs, control relays and current values of the function blocks,
 - adjust the time,
 - change from STOP mode to RUN mode and vice versa.

In simulation or monitoring mode, the monitoring window allows the status of the smart relay I/Os to be displayed within your application environment (diagram or image).

Zelio Logic smart relays

Compact and modular smart relays

"Zelio Soft 2" programming software

LADDER language

Definition



Text function block



Timer



Up/down counter



Fast counter



Analogue comparator



Clock



Control relay



Counter comparator



LCD backlighting



Summer/Winter time switching



Output coil



Message

LADDER language enables a LADDER program to be written with elementary functions, elementary function blocks and derived function blocks, as well as with contacts, coils and variables.
The contacts, coils and variables can be annotated. Text can be placed freely within the graphic.

■ Control scheme input modes

"Zelio input" mode enables users who have directly programmed the Zelio Logic smart relay to find the same user interface, even when using the software for the first time.

"Free input" mode, which is more intuitive, is very user-friendly and incorporates many additional features.

With LADDER programming language, two alternative types of symbol can be used :

- LADDER symbols,
- electrical symbols.

"Free input" mode also allows the creation of mnemonics and notes associated with each line of the program.

Instant switching from one input mode to the other is possible at any time, by simply clicking the mouse.

Up to 120 control scheme lines can be programmed, with 5 contacts and 1 coil per program line

■ Functions:

- 16 time delay function blocks; parameters of 11 different types can be set for each of these (1/10th second to 9999 hours),
- 16 up/down counter function blocks from 0 to 32767,
- 1 fast counter (1 kHz),
- 16 Text function blocks,
- 16 analogue comparator function blocks,
- 8 clock function blocks, each with 4 channels,
- 28 control relays,
- 8 counter comparators,
- automatic Summer/Winter time switching,
- variety of functions: coil, latching (Set/Reset), impulse relay, contactor,
- LCD screen with programmable backlighting,
- 28 message blocks (with communication interface, see page 32).

Functions

Function	Electrical scheme	LADDER language	Notes
Contact		 or 	I corresponds to the real state of the contact connected to the input of the smart relay. i corresponds to the inverse state of the contact connected to the input of the smart relay.
Standard coil			The coil is energised when the contacts to which it is connected are closed.
Latch coil (Set)			The coil is energised when the contacts to which it is connected are closed. It remains tripped when the contacts re-open.
Unlatch coil (Reset)			The coil is de-energised when the contacts to which it is connected are closed. It remains inactive when the contacts re-open.

Function block diagram language (FBD) (1)

























Definition

FBD language allows graphical programming based on the use of predefined function blocks.








This language provides the use of 24 pre-programmed functions for counting, time delay, timing, definition of switching threshold (example: temperature regulation), generation of impulses, time programming, multiplexing, display, etc.

Pre-programmed functions







Zelio Logic smart relays provide a high processing capacity, up to 200 function blocks, including 24 pre-programmed functions:

 TIMER AC TIMER A/C Timer. Function A/C (ON-delay and OFF-delay)	 TIMER BH TIMER B/H Timer. Function BH. (adjustable pulsed signal)	 TIMER BW TIMER B/W Timer. Function BW (pulse on rising/falling edge)
 TIMER Li TIMER L/i Pulse generator (ON-delay, OFF-delay)	 BISTABLE BISTABLE Impulse relay function	 SET-RESET SET & RESET Bistable latching - Priority assigned either to SET or RESET function
 BOOLEAN BOOLEAN Allows logic equations to be created between connected inputs	 CAM CAM Cam programmer	 PRESET COUNT PRESET COUNT Up/down counter
 UP DOWN COUNT UP DOWN COUNT Up/down counter with external preset	 PRESET H-METER PRESET H-METER Hour counter (hour, minute preset)	 TIME PROG TIME PROG Time programmer, weekly and annual.
 GAIN GAIN Allows conversion of an analogue value by change of scale and offset.	 TRIGGER TRIGGER Defines an activation zone with hysteresis	 MUX MUX Multiplexing functions on 2 analogue values
 MAX COMP IN ZONE MAX VAL MIN Zone comparison (Min. ≤ Value ≤ Max.)	 ADD/SUB ADD/SUB Add and/or subtract function	 MUL/DIV MUL/DIV Multiply and/or divide function
 DISPLAY DISPLAY Display of digital and analogue data, date, time, messages for Human-Machine interface.	 COMPARE COMPARE Comparison of 2 analogue values using the operands =, >, <, ≤, ≥.	 STATUS STATUS Access to smart relay status
 ARCHIVE ARCHIVE Storage of 2 values simultaneously	 SPEED COUNT SPEED COUNT Fast counting up to 1 kHz	 COM COM Sending of messages with communication interface (see page 32).

SFC functions (2) (GRAFSET)

 RESET-INIT RESET-INIT Reinitialisable step	 INIT STEP INIT STEP Initial step	 STEP STEP SFC step
 DIV-OR 2 DIV-OR 2 Divergence to OR	 CONV-OR 2 CONV-OR 2 Convergence to OR	 DIV-AND 2 DIV-AND 2 Divergence to AND
 CONV-AND 2 CONV-AND 2 Convergence to AND		

Logic functions

 AND AND AND function	 OR OR OR function	 NAND NAND NOT AND function
 NOR NOR NOT OR function	 XOR XOR Exclusive OR function	 NOT NOT NOT function

(1) Function Block Diagram.

(2) Sequential Function Chart.

General environment characteristics (except for communication Modem interface SR2 COM01, Modems SR2 MOD01 and SR2 MOD02, see page 37)

Product certifications			UL, CSA, GL (pending), C-Tick
Conformity with the low voltage directive	Conforming to 73/23/EEC		EN (IEC) 61131-2 (open equipment)
Conformity with the EMC directive	Conforming to 89/336/EEC		EN (IEC) 61131-2 (Zone B) EN (IEC) 61000-6-2, EN (IEC) 61000-6-3 (1) and EN (IEC) 61000-6-4
Degree of protection	Conforming to IEC/EN 60529		IP 20
Overvoltage category	Conforming to IEC/EN 60664-1		3
Degree of pollution	Conforming to IEC/EN 61131-2		2
Ambient air temperature around the device	Operation	°C	- 20... + 55 (+ 40 in enclosure), conforming to IEC 60068-2-1 and IEC 60068-2-2
	Storage	°C	- 40... + 70
Maximum relative humidity			95% without condensation or dripping water
Maximum operating altitude	Operation	m	2000
	Transport	m	3048
Mechanical resistance	Immunity to vibration		IEC/EN 60068-2-6, test Fc
	Immunity to mechanical shock		IEC/EN 60068-2-27, test Ea
Resistance to electrostatic discharge	Immunity to electrostatic discharge		IEC/EN 61000-4-2, level 3
Resistance to HF interference (immunity)	Immunity to electromagnetic radiated fields		IEC/EN 61000-4-3, level 3
	Immunity to fast transients in bursts		IEC/EN 61000-4-4, level 3
	Immunity to shock waves		IEC/EN 61000-4-5
	Radio frequency in common mode		IEC/EN 61000-4-6, level 3
	Voltage dips and breaks (v)		IEC/EN 61000-4-11
	Immunity to damped oscillation waves		IEC/EN 61000-4-12
	Conforming to EN 55022/11 (Group 1)		Class B (1)
Conducted and radiated emissions			
Screw terminals connection capacity (Tightening using Ø 3.5 screwdriver)	Flexible cable with cable end	mm ²	1 conductor: 0.25..2.5, cable: AWG 24...AWG 14 2 conductors: 0.25..0.75, cable: AWG 24...AWG 18
	Semi-solid cable	mm ²	1 conductor: 0.2..2.5 cable: AWG 25...AWG 14
	Solid cable	mm ²	1 conductor: 0.2..2.5, cable: AWG 25...AWG 14 2 conductors: 0.2..1.5, cable: AWG 24...AWG 16
	Tightening torque	N.m	0.5

Processing characteristics

Number of control scheme lines	With LADDER programming		120
Number of function blocks	With FBD programming		Up to 200
Cycle time		ms	10...50
Response time		ms	20 minimum
Back-up time (in the event of power failure)	Day/time		10 years (lithium battery) at 25 °C
	Program and settings		10 years (EEPROM memory cartridge)
Program memory checking			On each power-up
Clock drift			12 min/year (0 to 55 °C)
			6 sec/month (at 25 °C and calibration)
Timer block accuracy			1% ± 2 cycle time

12 V supply characteristics

Smart relay type			SR2 B121JD	SR2 B201JD	SR3 B261JD
Primary	Nominal voltage	V	12		
Voltage limits	Including ripple	V	10.4...14.4		
Nominal input current	Without extensions	mA	120	200	250
	With extensions	mA	—		400
Power dissipated	Without extensions	W	1.5	2.5	3
	With extensions	W	—		5
Micro-breaks	Permissible duration	ms	≤ 1 (repeated 20 times)		
Protection			Against reverse polarity		

(1) Except for the configuration SR3 B...BD + SR3 MBU01BD + SR3 XT43BD class A (class B: work in progress).

24 V supply characteristics

Smart relay type			SR2 ●1●1BD	SR2 B122BD	SR2 ●201BD	SR2 B202BD	SR3 B101BD	SR3 B102BD	SR3 B261BD	SR3 B262BD
Primary	Nominal voltage	V	24							
Voltage limits	Including ripple	V	19.2...30							
Nominal input current	Without extensions	mA	100					50	190	70
	With extensions	mA	—				100	160	300	180
Power dissipated	Without extensions	W	3	6	3	4		6	5	
	With extensions	W	—				8	10		
Micro-breaks	Permissible duration	ms	≤ 1 (repeated 20 times)							
Protection			Against reverse polarity							

24 V supply characteristics

Smart relay type			SR2 ●121B	SR2 ●201B	SR3 B101B	SR3 B261B
Primary	Nominal voltage	V	24			
Voltage limits		V	20.4...28.8			
Nominal frequency		Hz	50-60			
Nominal input current	Without extensions	mA	145	233	160	280
	With extensions	mA	—		280	415
Power dissipated	Without extensions	VA	4	6	4	7.5
	With extensions	VA	—		7.5	10
Micro-breaks	Permissible duration	ms	≤ 10 (repeated 20 times)			
rms insulation voltage		V	1780 (50-60 Hz)			

100...240 V supply characteristics

Smart relay type			SR2 ●101FU	SR2 ●121FU	SR2 ●201FU	SR3 B101FU	SR3 B261FU
Primary	Nominal voltage	V	100...240				
Voltage limits		V	85...264				
Nominal input current	Without extensions	mA	80/30		100/50	80/30	100/50
	With extensions	mA	—		80/40		80/60
Power dissipated	Without extensions	VA	7		11	7	12
	With extensions	VA	—		12		17
Micro-breaks	Permissible duration	ms	10				
rms insulation voltage		V	1780				

Discrete input characteristics (inputs I1...IA and IH...IR)

Smart relay type			SR● ●●●●JD	SR● ●●●●BD
Nominal value of inputs	Voltage	V	12	24
	Current	mA	4	
Input switching limit values	At state 1	Voltage	V	≥ 5.6
		Current	mA	≥ 2.20
	At state 0	Voltage	V	≤ 2.4
		Current	mA	< 0.9
Input impedance at state 1		kΩ	2.7	7.4
Conforming to IEC/EN 61131-2			Type 1	
Sensor compatibility	3-wire		Yes PNP	
	2-wire		No	
Input type			Resistive	
Isolation	Between supply and inputs		None	
	Between inputs		None	
Maximum counting frequency		kHz	1	
Protection	Against inversion of terminals		Control instructions not executed	

Discrete or analogue --- input characteristics (inputs IB...IG)

--- discrete inputs

Smart relay type			SR● ●●●●JD	SR● ●●●●BD
Nominal value of inputs	Voltage	V	12	24
	Current	mA	4	
Input switching limit values	At state 1	Voltage	V	≥ 7
		Current	mA	≥ 0.5
	At state 0	Voltage	V	≤ 3
		Current	mA	≤ 0.2
Input impedance at state 1		kΩ	14	12
Conforming to IEC/EN 61131-2			Type 1	
Sensor compatibility	3-wire		Yes PNP	
	2-wire		No	
Input type			Resistive	
Isolation	Between supply and inputs		None	
	Between inputs		None	
Maximum counting frequency		kHz	1	
Protection	Against inversion of terminals		Control instructions not executed	

--- analogue inputs

Smart relay type		SR●●●●JD	SR●●●●BD
Input range		V	0...10 or 0...12
Input impedance		kΩ	14
Maximum non destructive voltage		V	14.4
Value of LSB			39 mV, 4 mA
Input type			Common mode
Conversion	Resolution		8 bits
	Conversion time		Smart relay cycle time
	Precision at 25 °C		± 5 %
	at 55 °C		± 6.2 %
	Repeat accuracy at 55 °C		± 2 %
Isolation	Between analogue channel and supply		None
Cabling distance		m	10 maximum, with screened cable (sensor not isolated)
Protection	Against inversion of terminals		Control instructions not executed

Analogue --- input characteristics (inputs IH, IJ and Pt)

Analogue inputs	Application		0 -10 V	0-20 mA	Pt100
	Assignable inputs		IH and IJ	IH and IJ	IJ
	Input range		0...10 Vdc	0...20 mA	- 25 °C...+ 125 °C
	Input impedance	Ω	18 k	246	—
	Maximum non destructive value		30 V	30 mA	—
	Value of LSB		9.8 mV	20 μA	0.15 °C
	Input type		Common mode		Pt100 probe - IEC 751 3-wire
Conversion	Resolution		10 bits		
	Conversion time		Smart relay cycle time		
	Precision	at 25 °C	± 1 %		± 1.5 °C
		at 55 °C	± 1 %		± 1.5 °C
	Repeat accuracy at 25 °C		< ± 1 %		< ± 0.3 °C
Isolation	Between analogue chan. & supply		None		
Cabling distance		m	10 maximum, with screened cable (sensor not isolated)		
Protection	Against inversion of terminals		Control instructions not executed		—

Discrete ~ input characteristics

Smart relay type				SR●●●●B	SR●●●●FU
Nominal value of inputs	Voltage		V	24	100... 240
	Current		mA	4.4	0.6
	Frequency		Hz	47...63	
Input switching limit values	At state 1	Voltage	V	≥ 14	≥ 79
		Current	mA	> 2	> 0.17
	At state 0	Voltage	V	≤ 5	≤ 40
		Current	mA	< 0.5	
Input impedance at state 1			kΩ	4.6	350
Configurable response time	State 0 to 1 (50/60 Hz)		ms	50	
	State 1 to 0 (50/60 Hz)		ms	50	
Isolation	Between supply and inputs			None	
	Between inputs			None	
Protection	Against inversion of terminals			Control instructions not executed	

Relay output characteristics

Smart relay type			SR2 ●●●/ SR3 B101●●/ SR3 XT61●●/ SR3 XT101●●	SR3 B261●●	SR3 XT141●●	
Operating limit values			V	--- 5...150 ~ 24...250		
Contact type				N/O		
Thermal current			A	8	8 outputs: 8 A 2 outputs: 5 A	4 outputs: 8 A 2 outputs: 5 A
Electrical durability for 500 000 operating cycles	Utilisation category	DC-12	V	24		
			A	1.5		
		DC-13	V	24 (L/R = 10 ms)		
			A	0.6		
		AC-12	V	230		
			A	1.5		
		AC-15	V	230		
			A	0.9		
Minimum switching capacity		At minimum voltage of 12 V	mA	10		
Low power switching reliability of contact				12 V - 10 mA		
Maximum operating rate	No-load		Hz	10		
	At Ie (operational current)		Hz	0.1		
Mechanical life	In millions of operating cycles			10		
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-1 and IEC/EN 60664-1		kV	4		
Response time	Trip		ms	10		
	Reset		ms	5		
Built-in protection	Against short-circuits			None		
	Against overvoltage and overload			None		

Transistor output characteristics

Smart relay type			SR● B●●2BD
Operating limit values		V	19.2...30
Load	Nominal voltage	V	~ 24
	Nominal current	A	0.5
	Maximum current	A	0.625 at 30 V
Drop-out voltage	At state 1	V	≤ 2 for I = 0.5 A
Response time	Trip	ms	≤ 1
	Reset	ms	≤ 1
Built-in protection	Against overload and short-circuits		Yes
	Against overvoltage (1)		Yes
	Against inversions of power supply		Yes

(1) If there is no volt-free contact between the smart relay output and the load.

Analogue output characteristics (QB, QC)

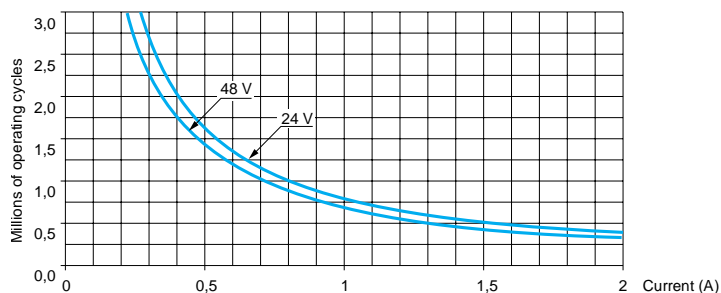
Analogue outputs	Output range		V	\sim 0...10
	Type of load			Resistive
	Maximum load		mA	10
	Value of LSB		mV	10
Conversion	Resolution			10 bits
	Conversion time			Smart relay cycle time
	Precision	at 25 °C		$\pm 1\%$ of the full scale value
		at 55 °C		$\pm 1\%$ of the full scale value
	Repeat accuracy at 55 °C			$< \pm 1\%$
Isolation	Between analogue channel and supply			None
Cabling distance			m	10 maximum, with screened cable
Built-in protection	Against inversion of terminals			Yes

Electrical durability of relay outputs

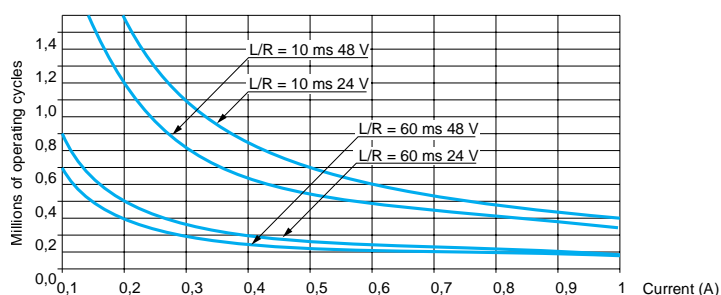
(in millions of operating cycles, conforming to IEC 60947-5-1)

d.c. loads

DC-12 (1)



DC-13 (2)



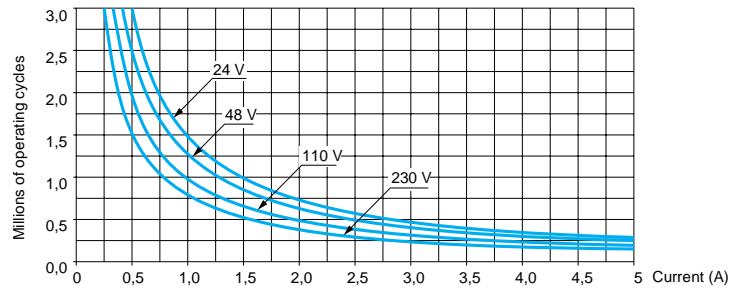
- (1) DC-12: switching resistive loads and photo-coupler isolated solid-state loads, $L/R \leq 1$ ms.
 (2) DC-13: switching electromagnets, $L/R \leq 2 \times (U_e \times I_e)$ in ms, U_e : rated operational voltage, I_e : rated operational current (with a protection diode on the load, DC-12 curves must be used with a coefficient of 0.9 applied to the number in millions of operating cycles).

Electrical durability of relay outputs (continued)

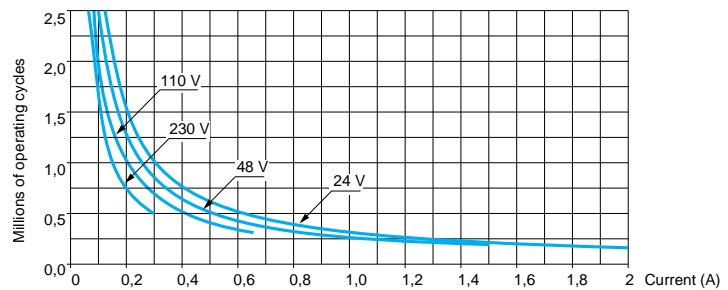
(in millions of operating cycles, conforming to IEC 60947-5-1)

a.c. loads

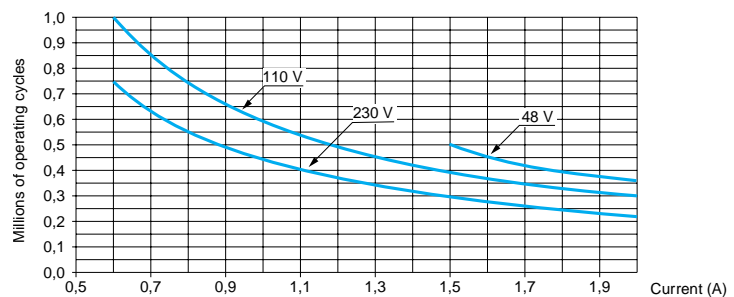
AC-12 (1)



AC-14 (2)



AC-15 (3)



- (1) AC-12: switching resistive loads and photo-coupler isolated solid-state loads, $\cos \geq 0.9$.
 (2) AC-14: switching small electromagnetic loads ≤ 72 VA, make: $\cos = 0.3$, break: $\cos = 0.3$.
 (3) AC-15: switching electromagnetic loads > 72 VA, make: $\cos = 0.7$, break: $\cos = 0.4$.

Zelio Logic smart relays

Compact smart relays



SR2 A201BD



SR2 E121BD



SR2 PACK...

Compact smart relays with display

Number of I/O	Discrete inputs	Including 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply \equiv 12 V							
12	8	4	4	0	Yes	SR2 B121JD	0.250
20	12	6	8	0	Yes	SR2 B201JD	0.380

Supply \equiv 24 V

10	6	0	4	0	No	SR2 A101BD (1)	0.250
12	8	4	4	0	Yes	SR2 B121BD	0.250
	8	4	0	4	Yes	SR2 B122BD	0.220
20	12	2	8	0	No	SR2 A201BD (1)	0.380
	12	6	8	0	Yes	SR2 B201BD	0.380
	12	6	0	8	Yes	SR2 B202BD	0.280

Supply \sim 24 V

12	8	0	4	0	Yes	SR2 B121B	0.250
20	12	0	8	0	Yes	SR2 B201B	0.380

Supply \sim 100...240 V

10	6	0	4	0	No	SR2 A101FU (1)	0.250
12	8	0	4	0	Yes	SR2 B121FU	0.250
20	12	0	8	0	No	SR2 A201FU (1)	0.380
	12	0	8	0	Yes	SR2 B201FU	0.380

Compact smart relays without display

Number of I/O	Discrete inputs	Including 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply \equiv 24 V							
10	6	0	4	0	No	SR2 D101BD (1)	0.220
12	8	4	4	0	Yes	SR2 E121BD	0.220
20	12	2	8	0	No	SR2 D201BD (1)	0.350
	12	6	8	0	Yes	SR2 E201BD	0.350

Supply \sim 24 V

12	8	0	4	0	Yes	SR2 E121B	0.220
20	12	0	8	0	Yes	SR2 E201B	0.350

Supply \sim 100...240 V

10	6	0	4	0	No	SR2 D101FU (1)	0.220
12	8	0	4	0	Yes	SR2 E121FU	0.220
20	12	0	8	0	No	SR2 D201FU (1)	0.350
	12	0	8	0	Yes	SR2 E201FU	0.350

Compact "discovery" packs

Number of I/O	Pack contents	Reference	Weight kg
Supply \equiv 24 V			
12	An SR2 B121BD compact smart relay with display, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR2 PACKBD	0.700
20	An SR2 B201BD compact smart relay with display, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR2 PACK2BD	0.850
Supply \sim 100...240 V			
12	An SR2 B121FU compact smart relay with display, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR2 PACKFU	0.700
20	An SR2 B201FU compact smart relay with display, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR2 PACK2FU	0.850

(1) Programming on smart relay in LADDER language only.

Zelio Logic smart relays

Modular smart relays



SR3 B101BD



SR3 XT61BD



SR3 XT141BD



SR3 XT43BD

Modular smart relays with display

Number of I/O	Discrete inputs	Including 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply \sim 12 V							
26	16	6	10	0	Yes	SR3 B261JD (1)	0.400
Supply \sim 24 V							
10	6	4	4	0	Yes	SR3 B101BD	0.250
	6	4	0	4	Yes	SR3 B102BD	0.220
26	16	6	10 (2)	0	Yes	SR3 B261BD	0.400
	16	6	0	10	Yes	SR3 B262BD	0.300
Supply \sim 24 V							
10	6	0	4	0	Yes	SR3 B101B	0.250
26	16	0	10 (2)	0	Yes	SR3 B261B	0.400
Supply \sim 100-240 V							
10	6	0	4	0	Yes	SR3 B101FU	0.250
26	16	0	10 (2)	0	Yes	SR3 B261FU	0.400

Discrete I/O extension modules (3)

Number of I/O	Discrete inputs	Relay outputs	Reference	Weight kg
Supply \sim 12 V (for smart relay SR3 B261JD)				
6	4	2	SR3 XT61JD	0.125
10	6	4	SR3 XT101JD	0.200
14	8	6	SR3 XT141JD	0.220
Supply \sim 24 V (for smart relays SR3 B●●●BD)				
6	4	2	SR3 XT61BD	0.125
10	6	4	SR3 XT101BD	0.200
14	8	6	SR3 XT141BD	0.220
Supply \sim 24 V (for smart relays SR3 B●●●B)				
6	4	2	SR3 XT61B	0.125
10	6	4	SR3 XT101B	0.200
14	8	6	SR3 XT141B	0.220
Supply \sim 100-240 V (for smart relays SR3 B●●●FU)				
6	4	2	SR3 XT61FU	0.125
10	6	4	SR3 XT101FU	0.200
14	8	6	SR3 XT141FU	0.220

Analogue I/O extension modules

Supply \sim 24 V							
Number of I/O	Number of inputs	Including 0 - 10 V	Including 0 - 20 mA	Including Pt100	Output 0 - 10 V	Reference	Weight kg
4	2 (4)	2 max	2 max	1 max	2	SR3 XT43BD (1) (5)	0.110

Network communication module (3) (6)

For use on	Supply voltage	Reference	Weight kg
Modbus network (slave)	\sim 24 V	See page 31	0.300

Modular "discovery" packs

Number of I/O	Pack contents	Reference	Weight kg
Supply \sim 24 V			
10	An SR3 B101BD modular smart relay, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR3 PACKBD	0.700
26	An SR3 B261BD modular smart relay, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR3 PACK2BD	0.850
Supply \sim 100...240 V			
10	An SR3 B101FU modular smart relay, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR3 PACKFU	0.700
26	An SR3 B261FU modular smart relay, a connecting cable and "Zelio Soft 2" programming software supplied on CD-ROM.	SR3 PACK2FU	0.850

(1) Can only be used with "Zelio Soft 2" software version \geq V3.1.

(2) Including 8 outputs at maximum current of 8 A and 2 outputs at maximum current of 5 A.

(3) Power supply to the I/O extension and communication modules is via the modular smart relay.

(4) See page 26.

(5) Can only be used in FBD language.

(6) See pages 28 to 31.

Note : The smart relay and its associated extensions must have an identical voltage.

Zelio Logic smart relays

Compact and modular smart relays

Separate components



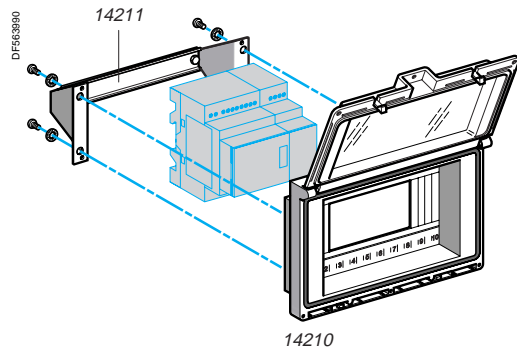
SR2 SFT01



SR2 USB01



SR2 MEM02



14210

"Zelio Soft 2" software for PC

Description	Application	Reference	Weight kg
Programming software "Zelio Soft 2", multilingual	For PC, supplied on CD-ROM (1), compatible with Windows 98, NT, 2000, XP and ME.	SR2 SFT01	0.200
Connecting cable	Between the PC (SUB-D, 9-pin connector) and the smart relay, length: 3 m	SR2 CBL01	0.150
	Between the PC (USB connector) and the smart relay, length: 3 m	SR2 USB01 ▲	0.100
Interface	For USB port (to be used with cable SR2 CBL01), length: 1.8 m	SR2 CBL06	0.350

Memory cartridges (2)

Description	Application	Reference	Weight kg
EEPROM memory cartridge	For firmware (software incorporated in the smart relay) version ≤ 2.4	SR2 MEM01	0.010
	For firmware (software incorporated in the smart relay) version ≥ 3.0	SR2 MEM02	0.010

Modem communication interface (3)

Description	Supply	Reference	Weight kg
Modem communication interface	~ 12...24 V	See page 38	

Converters

Description	Reference	Weight kg
Converters for thermocouples types J and K, for Pt100 probes and voltage/current	See page 48	–

Power supplies

Input voltage	Nominal output voltage	Reference	Weight kg
~ 100...240 V (47...63 Hz)	~ 12 V or ~ 24 V	See page 53	–

Mounting accessories (4)

Description	Mounting capacity	Application	Reference	Weight kg
Dust and damp-proof enclosure with split blanking plate arrangement, fitted with IP 55 dust and damp-proof window with hinged flap.	- 1 or 2 SR2 modules with 10 or 12 I/O, or - 1 SR2 module with 20 I/O, or - 1 SR3 module with 10 I/O + 1 I/O extension module (6, 10 or 14 I/O), or - 1 SR3 module with 26 I/O + 1 I/O extension module (6 I/O).	For mounting through a door	14210	0.350
Fixing bracket and symmetrical mounting rail	–	For mounting enclosure 14210 through a door panel	14211	0.210

Documentation

Description	Application	Language	Reference	Weight kg
User's manual	For direct programming on the smart relay	English	SR2 MAN01EN	0.100
		French	SR2 MAN01FR	0.100
		German	SR2 MAN01DE	0.100
		Spanish	SR2 MAN01ES	0.100
		Italian	SR2 MAN01IT	0.100
		Portuguese	SR2 MAN01PO	0.100

(1) CD-ROM comprising "Zelio Soft 2" software, an application library, a self-training manual, installation instructions and a user's manual.

(2) Program loading using memory cartridge SR2 MEM02 is incompatible with Modem communication interface SR2 COM01.

(3) See pages 32 to 41.

(4) Products marketed under the Merlin Gerin brand.

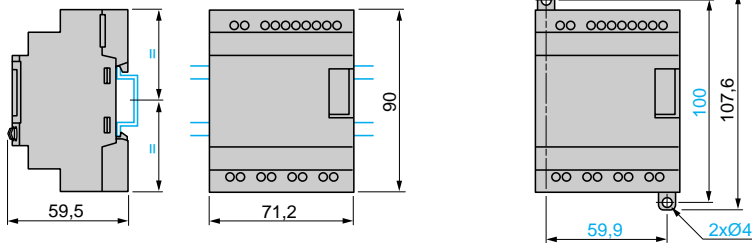
▲ Available 1st quarter 2006

Compact and modular smart relays

SR●●10●●● (10 I/O), SR2 ●12●●● (12 I/O)

Mounting on 35 mm rail

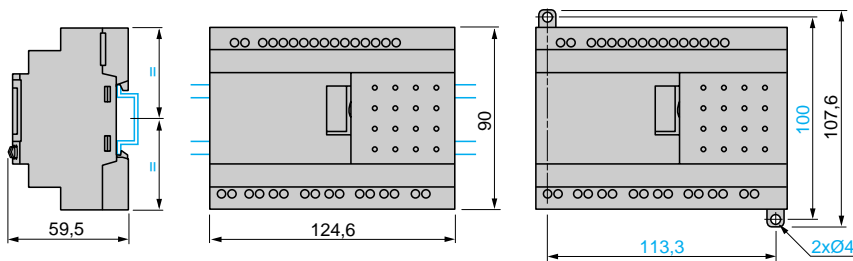
Screw fixing (retractable lugs)



SR2 ●20●●● (20 I/O), SR3 B26●●● (26 I/O)

Mounting on 35 mm rail

Screw fixing (retractable lugs)

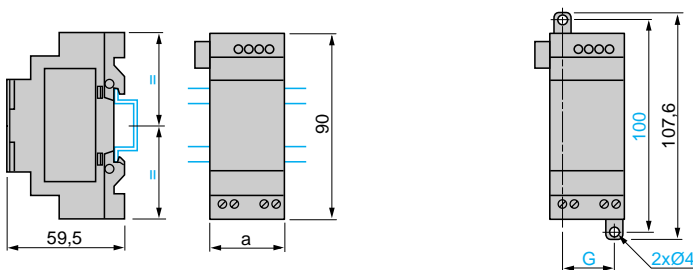


I/O extension modules

SR3 XT43BD (4 I/O), SR3 XT61●● (6 I/O), SR3 XT101●● and SR3 XT141●● (10 and 14 I/O)

Mounting on 35 mm rail

Screw fixing (retractable lugs)

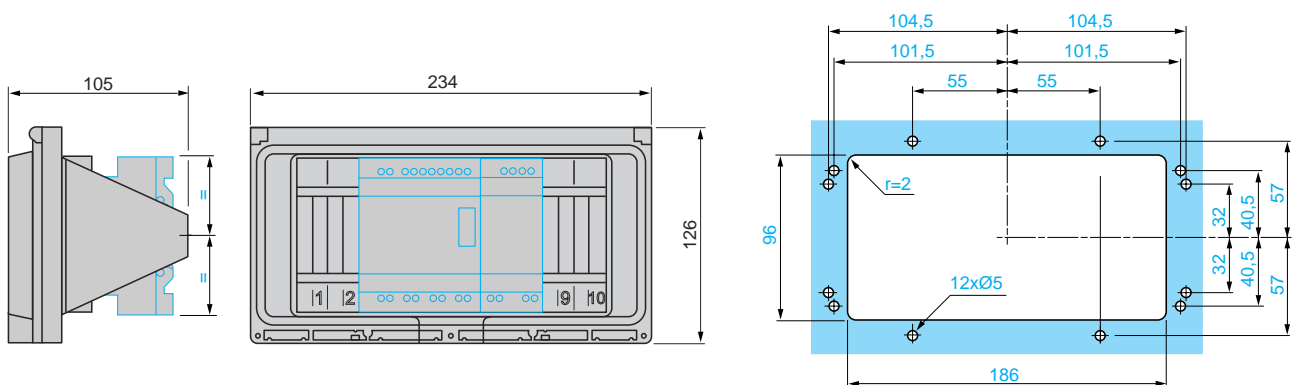


SR3	a	G
XT43BD	35,5	25
XT61●●	35,5	25
XT101●●	72	60
XT141●●	72	60

Enclosure + fixing bracket

14210 + 14211

Cut-out

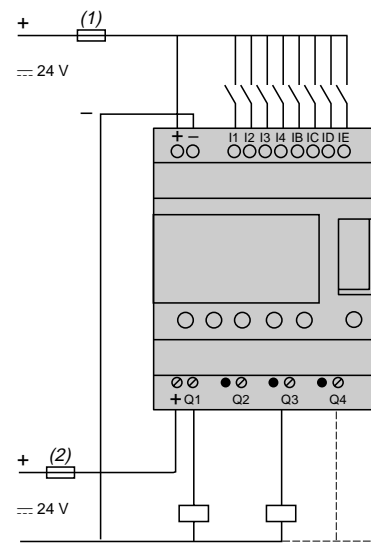
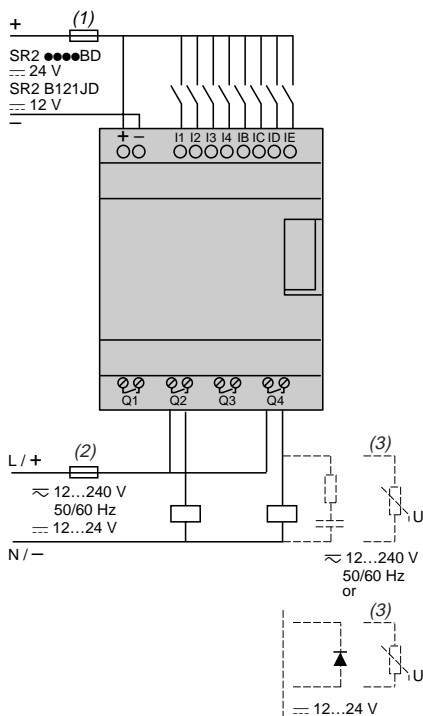


Connection of smart relays on \sim supply

SR \bullet $\bullet\bullet\bullet$ 1BD, SR \bullet $\bullet\bullet\bullet$ 1JD

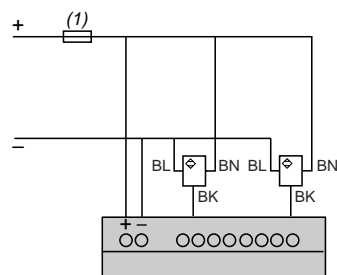
SR3 B261 \bullet D

SR2 B $\bullet\bullet$ 2BD and SR3 B $\bullet\bullet$ 2BD



- (1) 1 A quick-blow fuse or circuit-breaker.
 (2) Fuse or circuit-breaker.
 (3) Inductive load.
 (4) Q9 and QA: 5 A.

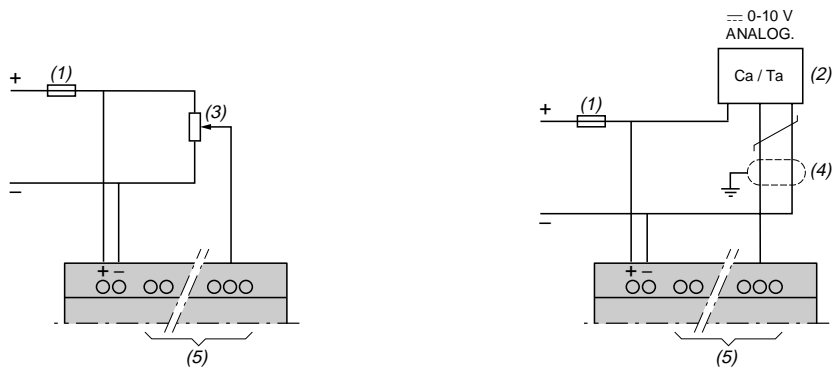
Discrete input used for 3-wire sensors



- (1) 1 A quick-blow fuse or circuit-breaker.

Connection of smart relays on --- supply (continued)

Analogue inputs



(1) 1 A quick-blow fuse or circuit-breaker.

(2) Ca: Analogue sensor / Ta: Analogue transmitter.

(3) Recommended values: 2.2 k Ω / 0.5 W (10 k Ω max.).

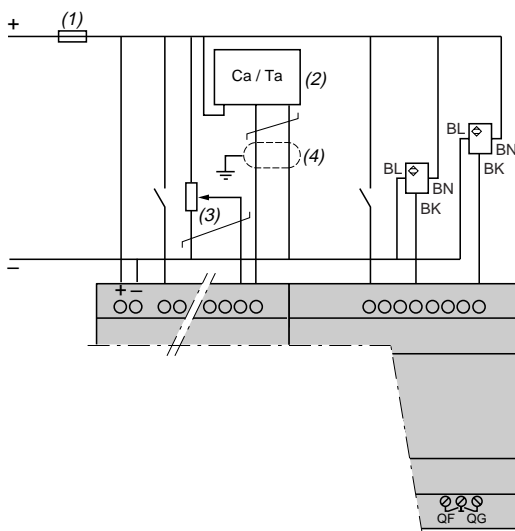
(4) Screened cables, maximum length 10 m.

(5) Analogue inputs according to smart relay, see table below:

Smart relays	Analogue inputs
SR2 12...D	IB...IE
SR2 A201BD	IB and IC
SR2 D201BD	IB and IC
SR2 B20...D	IB...IG
SR2 E201BD	IB...IG
SR3 B10...BD	IB...IE
SR3 B26...D	IB...IG

Connection of smart relays on --- supply, with discrete I/O extension modules

SR3 B...JD + SR3 XT...JD, SR3 B...BD + SR3 XT...BD



Warning: QF and QG: 5 A for SR3 XT141...

(1) 1 A quick-blow fuse or circuit-breaker.

(2) Ca: Analogue sensor / Ta: Analogue transmitter.

(3) Recommended values: 2.2 k Ω / 0.5 W (10 k Ω max.).

(4) Screened cables, maximum length 10 m.

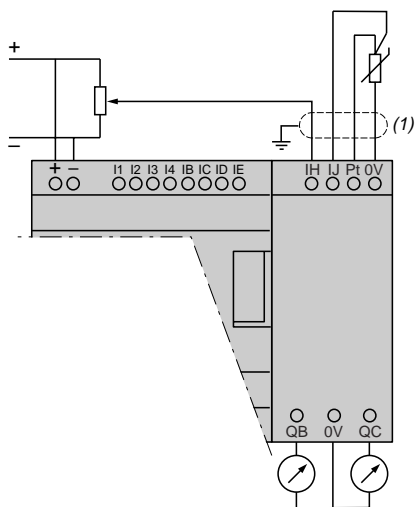
Connection of smart relays on --- supply, with analogue I/O extension module

SR3 B●●●BD + SR3 XT43BD

Connection alternatives

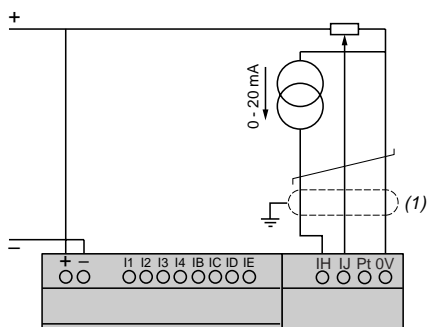
0 - 10 V	0 - 20 mA	Pt100
2	0	0
1	1	0
0	2	0
1	0	1
0	1	1

Application example with 1 x 0 - 10 V input and 1 x Pt100 input



(1) Screened cables, maximum length 10 m.

Application example with 1 x 0 - 20 mA input and 1 x 0 - 10 V input

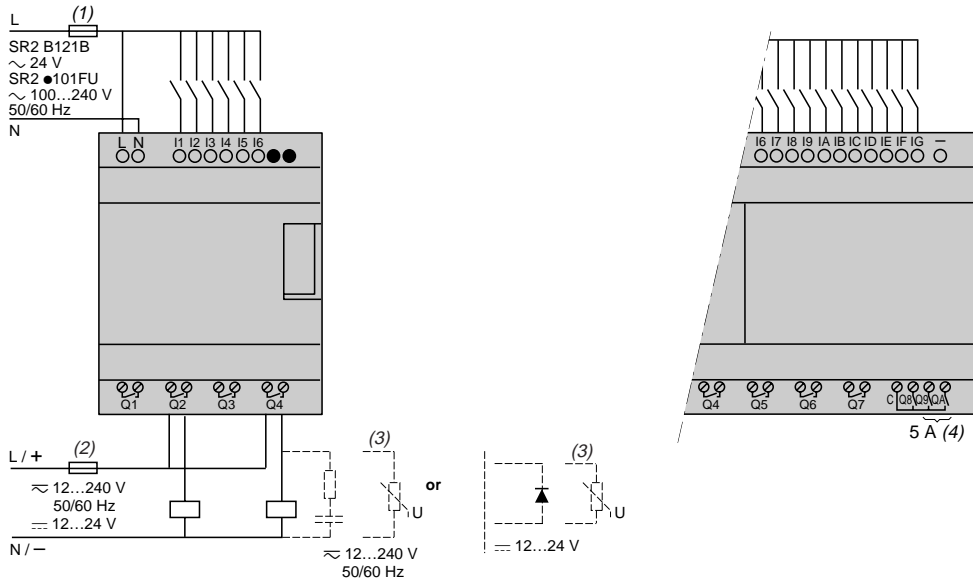


(1) Screened cables, maximum length 10 m.

Connection of smart relays on ~ supply

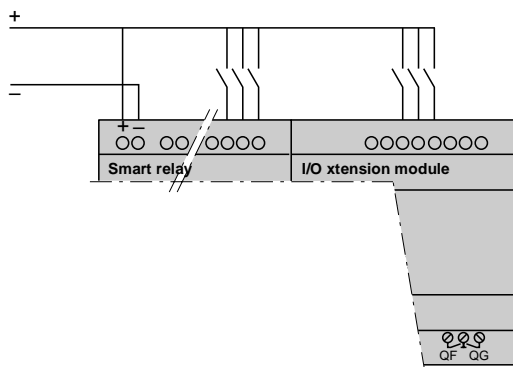
SR● ●●●1B, SR● ●●●1FU

SR3 B261B and SR3 B261FU



With discrete I/O extension module

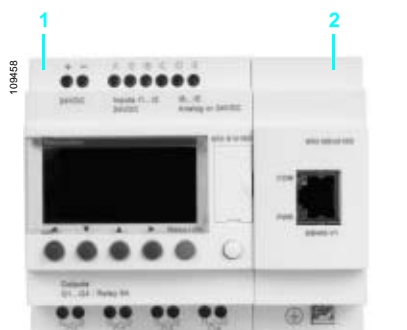
SR3 B●●●B + SR3 XT●●●B, SR3 B●●●FU + SR3 XT●●●FU



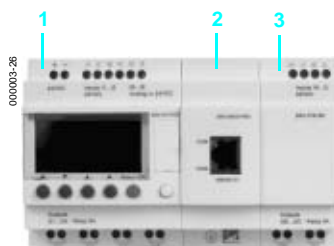


SR3 MBU01BD

Combination of smart relays with communication and I/O extension modules



- 1 Modular smart relay (10 or 26 I/O)
- 2 Modbus network slave communication module



- 1 Modular smart relay (10 or 26 I/O)
- 2 Network communication module
- 3 I/O extension module: discrete (6, 10 or 14 I/O) or analogue (4 I/O)

⚠ The order shown above must be observed when using a Modbus network slave communication module and a discrete or analogue I/O extension module.
An I/O extension module cannot be fitted before the Modbus network slave communication module.

Presentation

The Modbus protocol is of the master/slave type.

Two exchange methods are possible:

- request/reply: the request from the master is addressed to a specific slave. The master waits for the reply to be returned by the slave polled,
- distribution: the master distributes a request to all the slave stations on the bus. These stations execute the instruction without sending a reply.

Zelio Logic modular smart relays are connected to the Modbus network via the Modbus network slave communication module. This module is a slave that is not electrically isolated.

The Modbus network slave communication module must be connected to an SR3 B●●●BD modular smart relay, with a ~ 24 V supply.

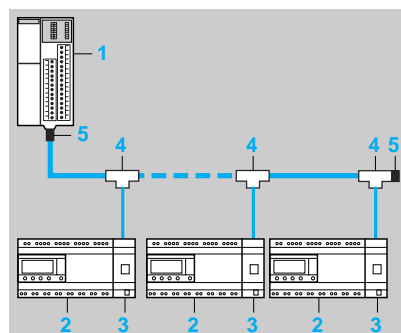
Configuration

The Modbus network slave communication module can be configured:

- independently, using the buttons on the smart relay,
- on a PC, using "Zelio Soft 2" software, see page 22.

When using a PC, programming can be performed either in LADDER language or in function block diagram (FBD) language, see pages 12 and 13.

Connection example



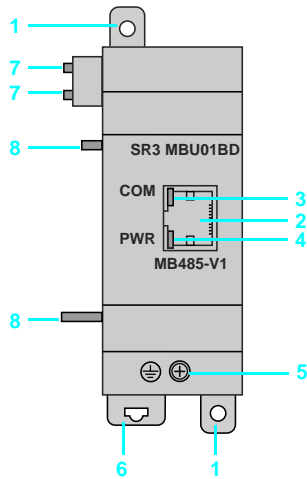
- 1 Modbus Master programmable controller (for example Twido).
- 2 Zelio Logic smart relay.
- 3 Modbus network slave communication module.
- 4 T-junction.
- 5 Line end adaptors.

Function description

- The Modbus network slave communication module is connected to a 2-wire or 4-wire Modbus network.
- The maximum length of the network is 1000 m (9600 bauds max., AWG 26).
- A maximum of 32 slaves can be connected to the Modbus network, or a maximum of 247 slaves with repeaters.
- Line end adaptors must be fitted to both ends of the line (1 nF/10 V, 120 Ω /0.25 W in series).
- The line must be polarised (470 Ω /0.25 W resistors) (1).
- The connection cable and its RJ45 male connectors must be screened.
- The "COMMON" signal must be connected directly to the protective earth at one point on the bus.

(1) The polarisation resistors must be managed by the master.

Description



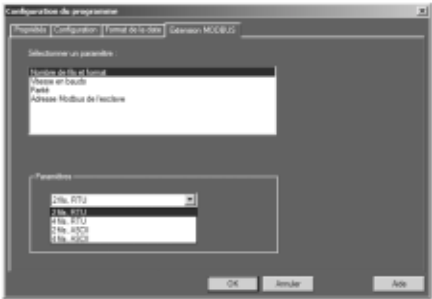
The Modbus network slave communication module **SR3 MBU01BD** comprises:

- 1 Two retractable fixing lugs.
- 2 A Modbus network connection (RJ45 screened female connector).
- 3 A communication LED (COM).
- 4 A "Power on" LED (PWR).
- 5 A screw terminal block for the protective earth connection.
- 6 A spring clip for mounting on a 35 mm mounting rail.
- 7 Two locating pegs.
- 8 Two locating pegs for clip-on fixing.

Environment characteristics

Product certifications			UL, CSA, GL (pending), C-TICK
Conformity with the low voltage directive	Conforming to 73/23/EEC		EN (IEC) 61131-2 (open equipment)
	Conforming to 89/336/EEC		EN (IEC) 61131-2 (Zone B) EN (IEC) 61000-6-2, EN (IEC) 61000-6-3 and EN (IEC) 61000-6-4
Degree of protection	Conforming to IEC/EN 60529		IP 20
Overvoltage category	Conforming to IEC/EN 60664-1		3
Degree of pollution	Conforming to IEC/EN 61131-2		2
Ambient air temperature around the device	Operation	°C	- 20... + 55 (+ 40 in enclosure), conforming to IEC 60068-2-1 and IEC 60068-2-2
	Storage	°C	- 40... + 70
Maximum relative humidity			95% without condensation or dripping water
Maximum operating altitude	Operation	m	2000
	Transport	m	3048
Mechanical resistance	Immunity to vibration		IEC/EN 60068-2-6, test Fc
	Immunity to mechanical shock		IEC/EN 60068-2-27, test Ea
Resistance to electrostatic discharge	Immunity to electrostatic discharge		IEC/EN 61000-4-2, level 3
Resistance to HF interference (immunity)	Immunity to electromagnetic radiated fields		IEC/EN 61000-4-3, level 3
	Immunity to fast transients in bursts		IEC/EN 61000-4-4, level 3
	Immunity to shock waves		IEC/EN 61000-4-5
	Radio frequency in common mode		IEC/EN 61000-4-6, level 3
	Voltage dips and breaks (~)		IEC/EN 61000-4-11
	Immunity to damped oscillation waves		IEC/EN 61000-4-12
Conducted and radiated emissions	Conforming to EN 55022/11 (Group 1)		Class B

Parameter entry



Software workshop parameter entry window

Parameters can be entered either using “Zelio Soft 2” software or directly using the buttons on the Zelio Logic smart relay.

When the “RUN” instruction is given, the Zelio Logic smart relay initialises the Modbus network slave communication module in a configuration previously defined in the basic program.

The Modbus network slave communication module has 4 parameters:

- number of UART wires and format of the frames on the Modbus network,
- transmission speed,
- parity,
- network address of the Modbus module.

The default parameter settings are as follows: 2-wire, RTU, 19 200 bauds, even parity, address n°1.

Parameter entry	Options
Number of wires	2 or 4
Frame format	RTU or ASCII
Transmission speed in bauds	1200, 2400, 4800, 9600, 19 200, 28 800, 38 400, 57 600
Parity	None, even, odd
Network address	1 to 247

Addressing of Modbus exchanges

LADDER programming (1)

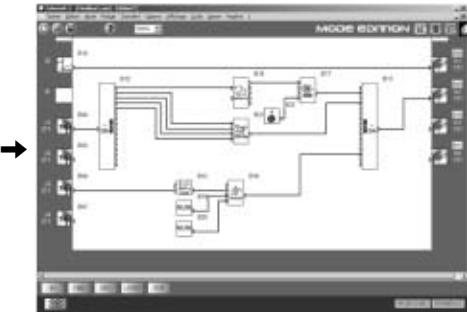
In LADDER mode, the 4 data words (16 bits) to be exchanged cannot be accessed by the application. Transfers with the master are implicit and are effected in a way that is totally transparent.

Modbus exchanges	Code	Number of words
Image of smart relay I/O	Read 03	4
	Read/Write 16, 06 or 03	4
Status 	Read 03	1

Function block diagram (FBD) programming (2)

In FBD mode, the 4 input data words (16 bits) (J1XT1 to J4XT1) and the 4 output data words (O1XT1 to O4XT1) can be accessed by the application. Dedicated function blocks make it possible to:

- break down a 'complete' type input (16 bits) into 16 separate “bit” type outputs.
□ example: break down a Modbus type input (J1XT1 to J4XT1) and copy these status values to discrete outputs.
- make up a 'complete' type output (16 bits) from 16 separate “bit” type outputs.
□ example: transfer the status value of the discrete inputs or the status of a function to a Modbus type output (O1XT1 to O4XT1).



Modbus exchanges	Code	Number of words
	Read/Write 16, 06 or 03	4
	Read 03	4
	Read/Write 16, 06 or 03	4
Status 	Read 03	1

(1) See page 12.
(2) See page 13.

References



SR3 MBU01BD

Modbus network slave communication module

For use with	Reference	Weight kg
Modular smart relays SR3 B●●1BD and SR3 B●●2BD (1)	SR3 MBU01BD	0.110

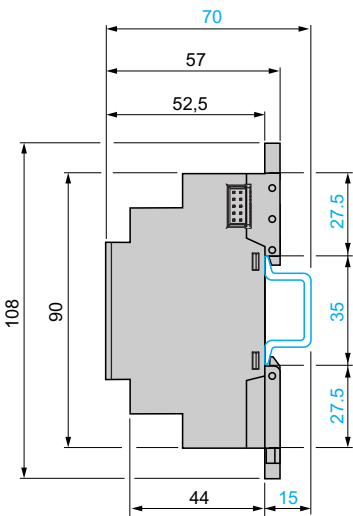
Connection accessories

Description	Reference	Weight kg
T-junctions	Complete with 0.3 m cable	VW3 A8 306TF03
	Complete with 1 m cable	VW3 A8 306TF10
	Without cable	170 XTS 04100
Cables with 2 x RJ45 connectors	Length 0.3 m	VW3 A8306R03
	Length 1 m	VW3 A8306R10
	Length 3 m	VW3 A8306R30

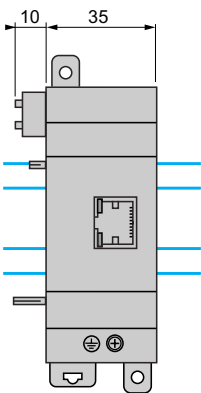
(1) Compatible with **SR3 B●●2BD** featuring hardware version "H1.0.01", available since June 2005

Dimensions and mounting

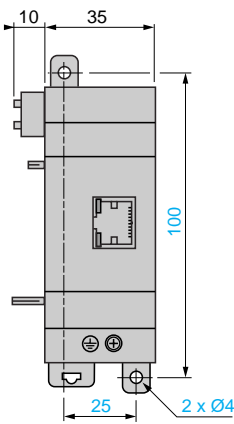
Side view



Rail mounting



Screw fixing



Zelio Logic smart relay

Modem communication interface

523083



SR2 COM01

Presentation

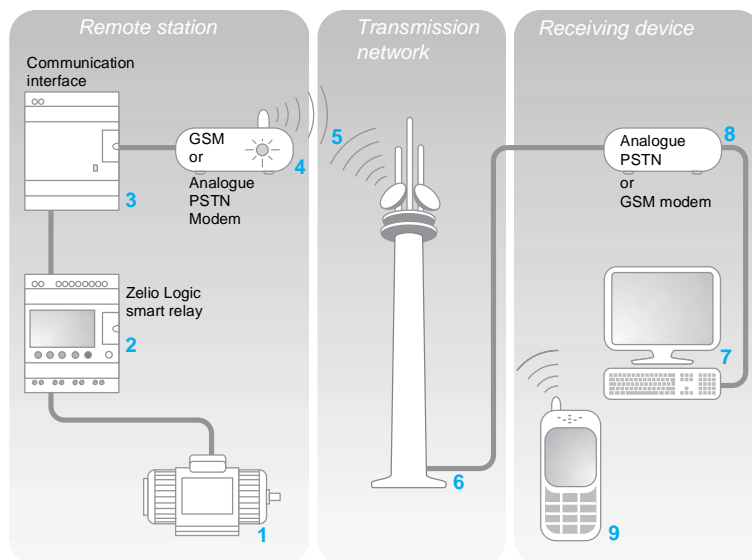
The communication products in the Zelio Logic range are primarily designed for monitoring or remote control of machines or installations which operate without personnel.

Examples:

- monitoring of lift pumps, livestock premises (ventilation, food level, etc.), refrigeration units, car-washes,
- alert in the event of failure of industrial or domestic heating boilers,
- remote control of lighting: car parks, warehouses,
- remote control and monitoring of escalators in large stores, in the transport sector,
- refuse compactor full alert.

The communication range comprises:

- a communication interface connected between a smart relay and a Modem,
- GSM (1) or analogue (PSTN) (2) Modems,
- "Zelio Logic Alarm" software.



The system comprises:

- a *Remote station*, machine or installation to be monitored **1**: control is achieved using a smart relay with clock from the "Zelio Logic" SR● B●●●●● or SR2 E●●●●● **2** range, via its inputs and outputs. The smart relay is connected via a communication interface **3** to a GSM (1) type Modem **4**, or, when a telephone line is available nearby, to an analogue PSTN modem (2),

- the GSM **5** or analogue **6** *TRANSMISSION NETWORK* provided by different telecommunication operators,

- a monitoring or control *Receiving device*, which may be one of the following:
 - a PC **7** fitted with an analogue PSTN or GSM Modem **8**,
 - or a GSM telephone **9**.

Note: the majority of Modems built into PCs can be used.

Various combinations are possible between the types of Modem used on the *Remote station* and the type of *Receiving device* (PC + Modems or GSM telephone).

The type of architecture selected will therefore depend mainly on:

- whether or not an analogue PSTN telephone line is available,
- whether or not it is necessary to send SMS messages, see page 35.

(2) Global System Mobile.

(3) Public Switched Telephone Network.

Presentation (continued)

Smart relay (Remote station)

The smart relay, as on an independent machine or installation, is used for control (1). It contains the application program created using "Zelio Soft 2" software.

The smart relay may be selected from the various models in the Zelio Logic range:

- for all supply voltages,
- with 10, 12, 20 or 26 I/O (up to 40 I/O with discrete extension module),
- with or without display,
- with clock.

The firmware version of the smart relay must be V3.1. or above.

Modem communication interface (Remote station)

The Modem communication interface allows messages, telephone numbers and calling conditions to be stored.

When the calling conditions are met, the messages, as well as any values to be sent, are date-stamped and stored in the interface.

The Modem communication interface scales analogue values to the physical values (degree, bar, Pascal, etc.) required by the user.

Modems

Either GSM or analogue PSTN type Modems can be used on both the *Remote station* and PC type *Receiving devices* (when the PC is not fitted with an internal Modem).

GSM modem

In order to exploit all the capabilities associated with Modem communication, the Modem(s) must be fitted with DATA type SIM cards. VOICE type SIM cards may be used but some functions will not be available. See table on page 35.

"Zelio Logic Alarm" alarm management software (PC type Receiving device)

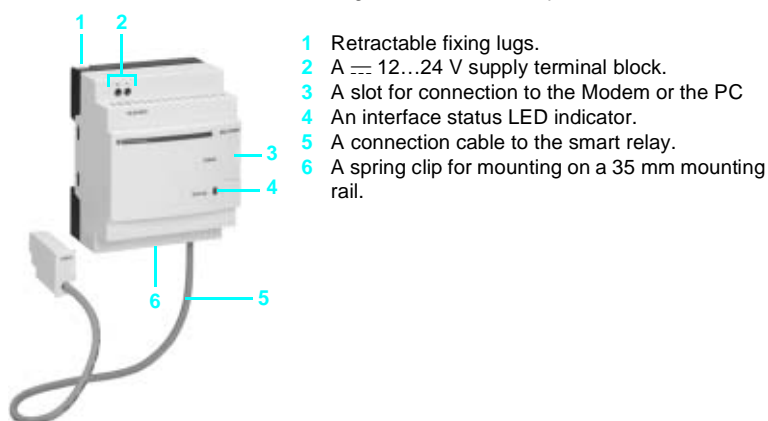
This software makes it possible to:

- receive, classify and export alarm messages,
- read or remotely force the status of program elements (inputs, outputs, control relays, timing or counting values, etc.),
- send control instructions (RUN, STOP, setting the time of the smart relay, etc.),
- send specific instructions (modifying access rights, recipients, etc.).

(1) Zelio Logic smart relays, see pages 8 to 27.

Description

The communication interface Zelio Logic SR2 COM01 comprises:



SR2 MOD02



SR2 MOD01

Zelio Logic smart relay

Modem communication interface



Functions

Sending of alerts

This function makes it possible to send an alert to a *Receiving device*. When the calling condition is met, a message is sent to one or several telephone numbers or e-mail addresses.

Types of message:

- alert message to a PC with Modem and "Zelio Logic Alarm" software,
- SMS message (1) to a GSM telephone,
- e-mail via SMS (1) (2).

One or all of the solutions can be selected simultaneously.

The *Remote station* to be monitored initiates the call.

The telephone line is only used while the alert message is being transmitted.

Up to 28 messages can be used.

These messages consist of:

- a 160 character text, which may contain a discrete and/or analogue value (counting values, analogue input voltages that can be scaled, etc.).
- 1 to 10 recipient telephone numbers/e-mail addresses.

Receipt of instruction

This function allows the status or the value of a program element to be modified from the *Receiving device*.

The operator initiates the call using the *Receiving device* (PC or GSM telephone). It is then possible to force the status of the discrete and/or analogue value of each of the 28 messages.

Remote dialogue using "Zelio Soft 2"

This function enables use of the Transfer, Monitoring and Diagnostics modes available in "Zelio Soft 2", via the *Transmission network* instead of the physical link (cable SR2 USB01 or SR2 CBL01) between the product (*Remote station*) and the PC (*Receiving device*).

It is then possible to:



- transfer a program created on a PC station to the *Remote station*,
- transfer a program installed on the *Remote station* to the PC station,
- modify, from the PC, the receiving device telephone numbers/e-mail addresses, and the alert sending conditions,
- update the firmware in the smart relay and the Modem communication interface,
- display and modify discrete and analogue values,
- perform diagnostics on the smart relay and on the Modem communication interface.

(1) Requires the use of a GSM Modem on the *Remote station* side.

(2) Verify with the *Transmission network* operator that the e-mail by SMS service is available.

Functions available depending on the hardware architecture and/or type of SIM card

Function	Remote station device				
	Analogue PSTN Modem	GSM Modem			
		Type of SIM card			
		DATA	DATA VOICE	VOICE	
			DATA N°	VOICE N°	
Send alert/receive instruction with GSM telephone					
Send alert/receive instruction with PC running "Zelio Logic Alarm" software (1)					
Transfer program Update firmware Monitoring					
Send alert to e-mail address					

 Functions available
 Functions not available

Note: Instructions cannot be transmitted by e-mail.

(1) When using a GSM Modem on the PC side, the SIM card must have a DATA number.

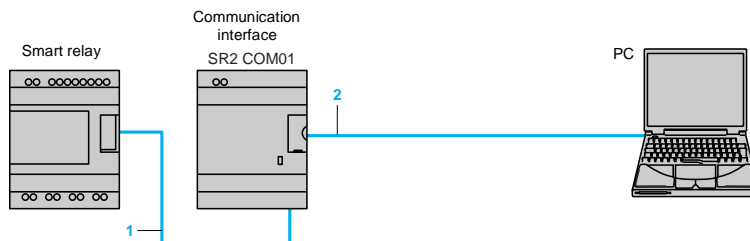
Zelio Logic smart relay

Modem communication interface

Installation set-up

Setting-up of the installation or the machine to be monitored involves 2 steps:

Connection for programming the smart relay and the interface



- 1 Interface cable marked COM-Z
- 2 Cable SR2 USB01 or SR2 CBL01.

After having powered-up the smart relay and the interface, the application program can be transferred in order to simultaneously:

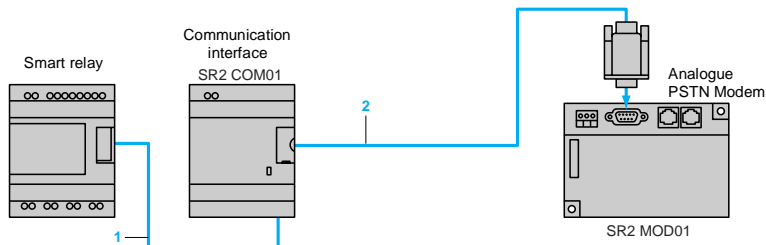
- load the automation system program into the smart relay,
- load the alert conditions, messages and telephone numbers/e-mail addresses into the interface.

This operation can also be carried out remotely using "Transfer" mode, after having made the operating connections described below.

⚠ Program loading using memory cartridges SR2 MEM01 or SR2 MEM02 is incompatible with Modem communication interface SR2 COM01.

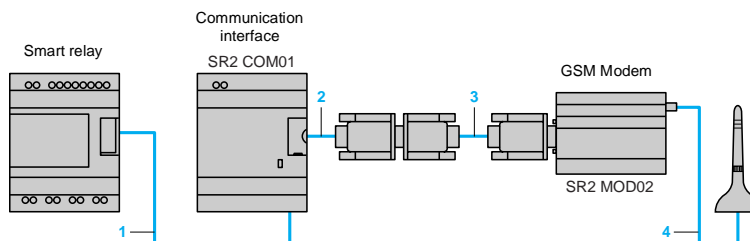
Operating connections

Analogue PSTN modem



- 1 Interface cable marked COM-Z.
- 2 Cable SR2 CBL07 included with the interface.

GSM Modem



- 1 Interface cable marked COM-Z.
- 2 Cable SR2 CBL07 included with the interface.
- 3 SUB-D 9/SUB-D 15 cable included with the Modem
- 4 Antenna and cable included with the Modem.

Environment characteristics of communication interface SR2 COM01

Product certifications	Environment category C		UL, CSA, C-Tick
Degree of protection			IP 20
Ambient air temperature	Operation	°C	- 20...+ 55 conforming to IEC/EN 60068-2-1 and 60068-2-2
	Storage	°C	- 25...+ 70 conforming to IEC/EN 61131-2
Maximum relative humidity			95% without condensation or dripping water
Maximum operating altitude		m	2000
Mechanical resistance	Vibration resistance		Conforming to IEC/EN 60068-2-6 test Fc ± 1 mm (2 to 13.2 Hz), ± 0.15 mm (13.2 to 57.6 Hz) 2 gn (57.6 to 150 Hz)
	Shock resistance		Conforming to IEC/EN 60068-2-27 test Ea
Resistance to electrostatic discharge			Conforming to IEC/EN 61000-4-2 level 3, 8 kV air, 6 kV at the contacts
Resistance to HF interference	Immunity to radiated electromagnetic fields		Conforming to IEC/EN 61000-4-3 level 3, 10 V per metre
	Immunity to fast transients in bursts		Conforming to IEC/EN 61000-4-4 level 3
	Immunity to shock waves		Conforming to IEC/EN 61000-4-5, on common mode supply 1 kV, serial mode supply 0.5 kV
	Immunity to damped oscillation waves		Conforming to IEC/EN 61000-4-12, on 1 kV supply, 30 seconds, 4 periods
	Conducted interference induced by radiated fields		IEC/EN 61000-4-6, 10 kHz to 80 MHz level 3: 10 V
Connection to screw terminals (tightened using Ø 3.5 screwdriver)	Flexible cable with cable end	mm ²	1 conductor: 0.14...1.5, AWG26...AWG16 cable 2 conductors: 0.14...0.75, AWG26...AWG18 cable
	Semi-solid cable	mm ²	1 conductor: 0.14...2.5, AWG26...AWG14 cable
	Solid cable	mm ²	1 conductor: 0.14...2.5, AWG26...AWG14 cable 2 conductors: 0.14...1.5, AWG26...AWG16 cable
	Tightening torque	Nm	0.6

Supply characteristics

Interface type		SR2 COM01	SR2 MOD01	SR2 MOD02
Nominal voltage	V	12...24		
Voltage limits	V	10...28.8	10...30	5.5...32
Maximum ripple		5 %	—	—
Nominal current	12 V	mA	30	140
	24 V	mA	30	70
	Current peak on power-up	mA	550	9600
Power dissipated		W	1.1	1.7
Micro-breaks	Permissible duration		1 ms, repeated 20 times	—
Protection	Integrated		Against reversed polarity	—
	To be provided externally	A	1 A fuse	Supplied with 2.5 A fuse

Characteristics of “Com-Z” link with the smart relay

Type of connector		Specific to Zelio
Type of link		Specific Zelio communication protocol
Compatibility		Only with Zelio Logic smart relays SR● B●●●● and SR2 E●●●● version V3.1 and above
Isolation of “Com-Z” connector	From the “Com-M” connector	By ~ 1780 V opto-coupler
	From the +/- supply terminals	By ~ 1780 V opto-coupler

Characteristics of “Com-M” link with the Modem

Type of connector		Specific to Zelio
Type of link with SR2 CBL07		RS 232 serial (included with the communication interface)
Compatibility	Analogue PSTN modem	AT commands
	GSM Modem	AT commands
Isolation of “Com-M” connector	From the Modem	By the cable SR2 CBL07
	From the +/- supply terminals	By the cable SR2 CBL07

Processing characteristics

Data saved by the interface	Messages	Up to 28 messages
	Telephone/e-mail details and recipient profiles	1 to 10 recipients (telephone numbers and/or e-mail addresses) per message
	Date and time	Dating of messages to be sent
	Discrete and digital values	Backup of values when the message activation condition is triggered.
Backup of data to be sent		Flash memory

Zelio Logic smart relay

Modem communication interface

523083



SR2 COM01

523084



SR2 MOD01

523085



SR2 MOD02

523086



SR2 CBL07

Modem communication interface

Description	Supply voltage	Reference	Weight kg
Communication interface (including cable SR2 CBL07)	--- 12...24 V	SR2 COM01 (1)	0.200

Modems

Description	Supply voltage	Reference	Weight kg
Analogue PSTN Modem Type SIXNET VT-MODEM-5-WW, including a telephone cable (length 2 m)	--- 12...24 V	SR2 MOD01	0.265

GSM Modem Type WAVECOM FASTRACK M1306 B dual band 900/1800 Mhz, including: <ul style="list-style-type: none"> ■ a supply cable (length 1.5 m), ■ fixing lugs for plate mounting, ■ a SUB-D 9/SUB-D 15 cable (length 0.5 m), ■ an antenna with cable (length 2 m). 	--- 12...24 V	SR2 MOD02 (2)	0.445
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Software

Description	Application Compatibility	Medium	Reference	Weight kg
Zelio Logic Alarm	PC Windows 98, NT4, 2000 and XP	CD-ROM	SR2 SFT02	0.200

Connection accessories

Description	Application	Length m	Reference	Weight kg
Connection cables	SUB-D9/SUB-D9 connectors Between modem and PC	1.8	SR1 CBL03	0.110
	Specific Zelio/SUB-D9 connector Between communication interface and modem	0.5	SR2 CBL07 (3)	0.050

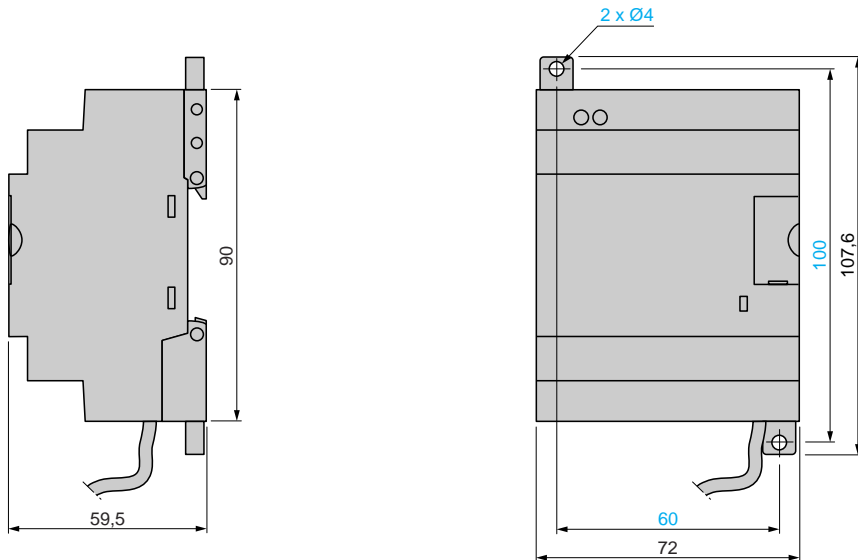
(1) Can only be used with "Zelio Soft 2" software version V3.1 or above.

(2) Not recommended for North America or Japan

(3) Spare part (cable included with communication interface SR2 COM01).

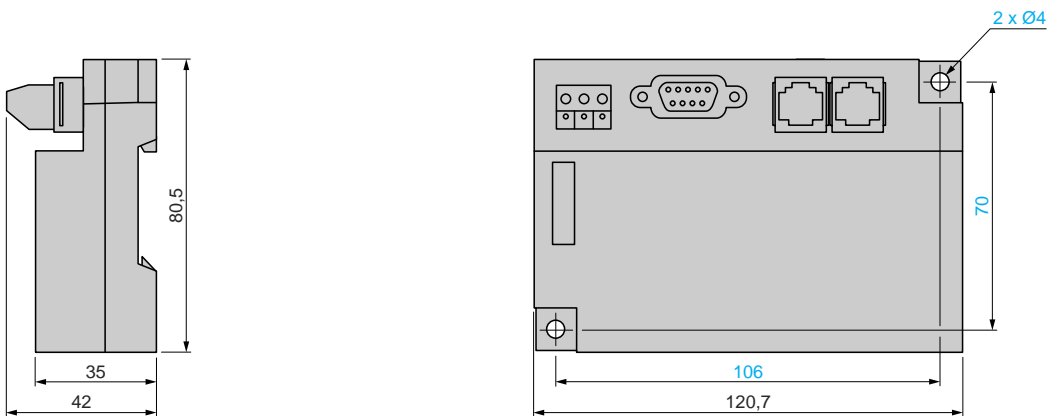
Communication interface

SR2 COM01

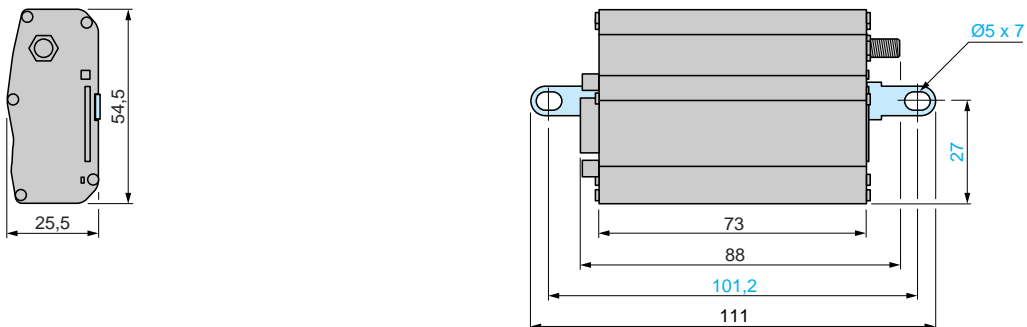


Modems

SR2 MOD01 (Analogue PSTN modem)

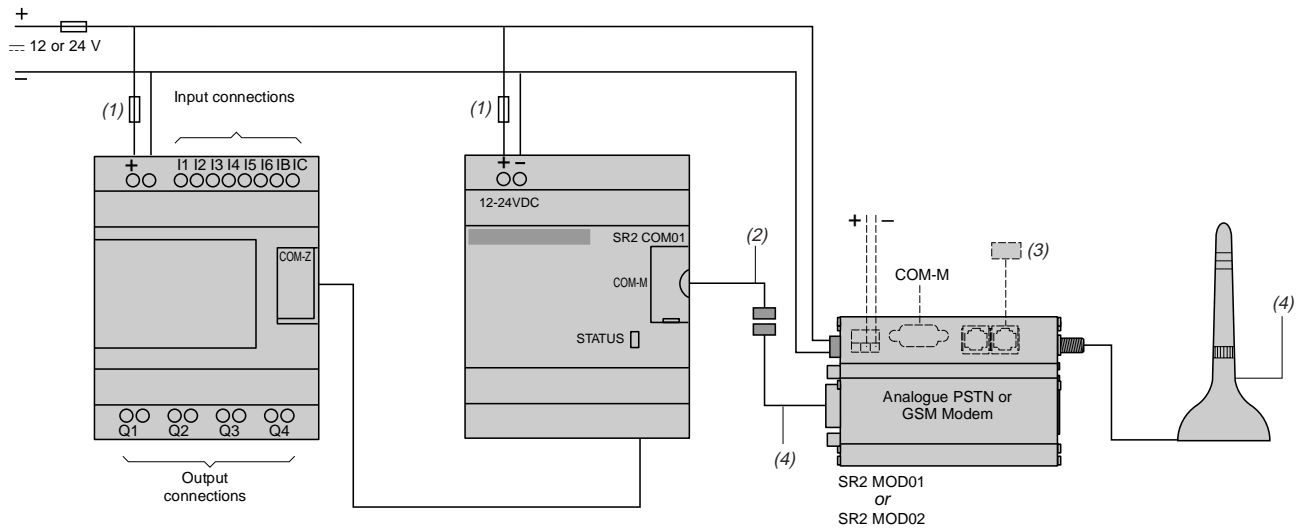


SR2 MOD02 (GSM modem)



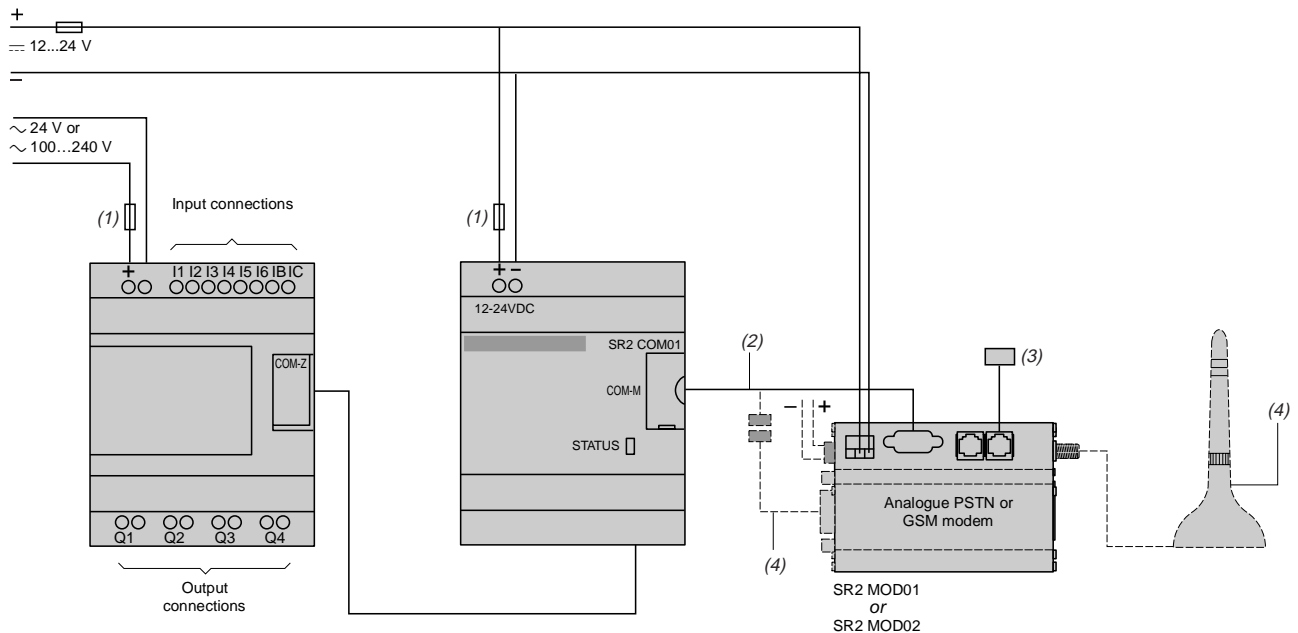
Connection schemes for connecting communication interface SR2 COM01 to the smart relay and the Modem

SR● B●●1JD, SR● B●●●BD et SR2 E●●●BD



- (1) 1 A quick-blow fuse.
 (2) Cable included with Modem communication interface SR2 COM01.
 (3) Cable for connection to the Transmission network (included with analogue PSTN modem).
 (4) Antenna and cable included with GSM Modem.

SR● B●●1B, SR● B●●●FU, SR2 E●●●B et SR2 E●●●FU

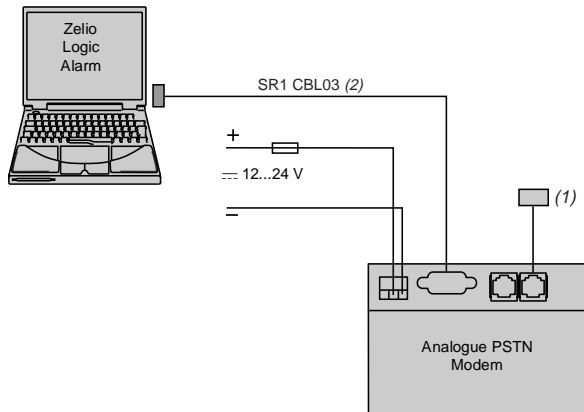


- (1) 1 A quick-blow fuse.
 (2) Cable included with Modem communication interface SR2 COM01.
 (3) Cable for connection to the Transmission network (included with analogue PSTN modem).
 (4) Antenna and cable included with GSM Modem.

Connection schemes for connecting the PC to the Modem

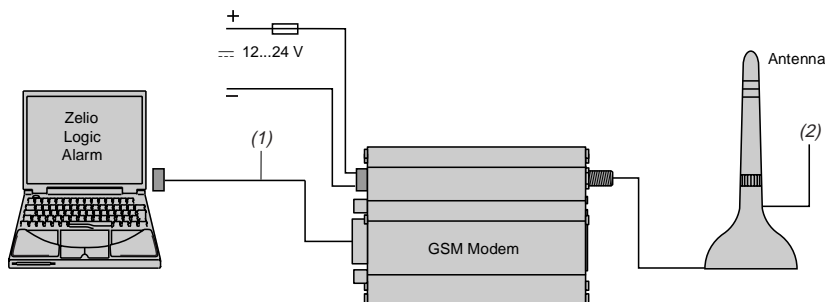
For PCs without an internal Modem.

Analogue PSTN Modem



(1) Cable for connection to the Transmission network (included with analogue PSTN modem).
 (2) To be ordered separately.

GSM Modem



(1) Cable included with the Modem (length: 50 cm). The cable length can be increased using SR1 CBL03 (1,8 m).
 (2) Antenna and cable included with GSM Modem.

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes

Voltage/current converters

Product types

Converters for thermocouples



Input type

Input signal

Temperature range

Voltage

Current

J (Fe-CuNi)

0...150 °C

32...302 °F

0...300 °C

32...572 °F

0...600 °C

32...1112 °F

K (Ni-CrNi)

0... 600 °C

32...1112 °F

0...1200 °C

32...2192 °F

Output signal

Voltage/Current

Switchable: 0...10 V / 0...20 mA; 4...20 mA

Supply voltage

Rated

24V ± 20%, not isolated

Built-in protection

Outputs

Supply

Reverse polarity, overvoltage and short-circuit
Output safety feature, if input not wired or wire broken
Reverse polarity

Signalling

Green LED (power on)

Conformity/Approvals

Conforming to standards

Approvals

IEC 60947-1, IEC 60584-1

UL, CSA, GL, CE

Type

RMT J40BD

RMT J60BD

RMT J80BD

RMT K80 BD

RMT K90BD

Pages

48

Converters for Universal and Optimum Pt100 probes

Voltage/current converters



Pt100, 2, 3 and 4-wire

- 40...40 °C -100...100 °C 0...100 °C 0...250 °C 0...500 °C
 - 40...104 °F - 148...212 °F 32...212 °F 32...482 °F 32...932 °F

—

—

0...10 V 0...10 V; ± 10 V 0...50 V;
 0...300 V;
 0...500 V
 --- or ~ 50/60 Hz

4...20 mA 0...20 mA;
 4...20 mA — 0...1.5 A;
 0...5 A; 0...15 A
 --- or ~ 50/60 Hz

Switchable:
 0... 10 V/0...20 mA , 4...20 mA for the Universal Pt100 range **RMP T●0BD**
 0...10 V or 4...20 mA for the Optimum Pt100 range **RMP T●3BD**

0...10 V or
 4...20 mA

Switchable:
 0...10 V; ±10 V/
 0...20 mA;
 4...20 mA

Switchable:
 0...10 V/
 4...20 mA;
 0...20 mA

0...10 V or
 0...20 mA or
 4...20 mA

--- 24V ± 20%, not isolated

--- 24V ± 20%, isolated

Reverse polarity, overvoltage and short-circuit
 Output safety feature, if input not wired or wire broken
 Reverse polarity

Green LED (power on)

IEC 60751, DIN 43 760
 UL, CSA, GL, CE

IEC 60947-1

RMP T1●BD RMP T2●BD RMP T3●BD RMP T5●BD RMP T7●BD RMC N22BD RMC L55BD RMC V60BD RMC A61BD

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes

Voltage/current converters

The Zelio Analog range of converters is designed to convert signals emitted by sensors or electrical measurements into standard electrical signals which are compatible with automation platforms, controllers (thermal processes, speed, ...). They also allow the connection distance between a sensor and the measurement acquisition device to be increased: for example between a thermocouple and a programmable controller.

Conforming to IEC standards, UL and CSA certified, these converters are suitable for universal use.

Measurement signals for thermocouples and Pt100 probes

The voltages induced by thermocouples vary between 10 and 80 $\mu\text{V}/^\circ\text{C}$, Pt100 probes (100 ohms at 0 $^\circ\text{C}$) produce about 0.5 mV/ $^\circ\text{C}$, with measurement currents of 1 mA. Depending on the sensor, the signal to be measured ranges from a few μV (thermocouple) to 250 and 700 mV for a Pt100 probe.

It is therefore difficult to transmit these low level signals over long electric lines without encountering problems of interference, signal reduction or errors.

Connecting Zelio Analog converters close to the sensors resolves these problems :

- 4-20 mA current loops transmitted over a long distance are less sensitive to interference than low level voltage signals from sensors,
- signal reductions during transmission (resistance) of voltages do not occur,
- the cables used to connect the converters to process equipment (programmable controllers) are standard cables, which are more cost effective than extension cables or compensation cables suitable for low level signals for Pt100 probes or thermocouples.

Presentation

The Zelio Analog range

The Zelio Analog range has been developed both to take account of the most common applications and to ensure great simplicity of installation:

- pre-set input and output scales, requiring no adjustment
- outputs protected against reverse polarity, overvoltage and short-circuits
- \sim 24 V power supply
- sealable protective cover
- rail mounting and screw fixing onto mounting plate
- LED indicator on the front panel
- input and output selector switches on the front panel
- output with fallback value if no input signal is present (due to failure of a sensor, for example).

The Zelio Analog converter range is divided into four families:

- Converters for J and K type thermocouples: **RMT J/K**
- Converters for Universal Pt100 probes: **RMP T●0**
- Converters for Optimum Pt100 probes: **RMP T●3**
- Universal voltage/current converters: **RMC**.

Converters for J and K type thermocouples

Thermocouples, which consist of two metals with different thermo-electric characteristics, produce a voltage that varies according to temperature. This voltage is transmitted to the Zelio Analog converter which converts it to a standard signal. Converters for thermocouples have cold junction compensation to allow detection of measurement errors induced by the connection to the device itself.

Converters for J and K type thermocouples have :

- for inputs, a pre-set temperature range, depending on the model:
 - Type J: 0...150 $^\circ\text{C}$, 0...300 $^\circ\text{C}$, 0...600 $^\circ\text{C}$
 - Type K: 0...600 $^\circ\text{C}$, 0...1200 $^\circ\text{C}$.
- for outputs, a switchable signal:
 - 0...10 V, 0... 20 mA, 4... 20 mA.



RMT J40BD



RMT K90BD

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes

Voltage/current converters



RMP T70BD

Converters for Universal Pt100 probes

Pt100 probes with platinum resistor are electrical conductors whose resistance varies according to the temperature.

This ohmic resistance is transmitted to the Zelio Analog converter which converts it to a standard signal.

Converters for Universal Pt100 probes have :

■ for inputs, a pre-set temperature range, depending on the model:

- -100...100 °C,
- - 40...40 °C,
- 0...100 °C,
- 0...250 °C,
- 0...500 °C.

■ for outputs, a switchable signal:

- 0... 10 V, 0... 20 mA, 4... 20 mA.

The products in the Universal Pt100 family allow wiring of Pt100 probes in 2, 3 and 4-wire mode.



RMC A61BD

Converters for Optimum Pt100 probes

Derived from the above family, these converters have:

■ for inputs, a pre-set temperature range identical to that of converters for Universal Pt100 probes.

■ for outputs: 0...10V signal dedicated to Zelio Logic analogue inputs.

They allow Pt100 probes to be wired in 2, 3 and 4-wire mode.

Universal voltage/current converters

This family of converters allows the adaptation of electrical values (voltage/current).

Four products are available:

■ a cost effective converter which will convert a 0...10 V signal to a 4...20mA signal or vice versa.

■ a Universal voltage/current converter allowing the most common signals. They have:

- for inputs, a voltage/current range:
 - 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.

- for outputs, a switchable voltage/current range:
 - 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.

■ two Universal voltage/current converters which allow conversion of electrical power signals, both a.c. and d.c.

They have the following, depending on the model:

- **for voltage inputs**, a range of 0 to 500 V (\sim or \equiv)

- for outputs, a switchable voltage/current range:

- 0...10 V, 0...20 mA, 4...20 mA.

- **for current inputs**, a range of 0 to 15 A (\sim or \equiv)

- for outputs, a voltage/current range:

- 0...10 V, 0...20 mA, 4...20 mA.



RMC L55BD

Description

Zelio Analog converters have the following on their front panel, depending on the model:

- 1 Two terminals for \equiv 24 V supply connection
- 2 A 'Power ON' LED
- 3 Three input selector switches (depending on model)
- 4 An output selector switch (depending on model)
- 5 A sealable protective cover
- 6 A screw terminal block for inputs
- 7 A screw terminal block for outputs.

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes

Voltage/current converters

Environment characteristics

Converter types		RMT J/K●●●●●, RMP ●●●●●, RMC●●●●●
Conforming to standards		IEC 60947-1, IEC 60584-1 (IEC 60751, DIN 43760 for RMP●●●●●)
Product certifications		UL, CSA, GL, C€
Degree of protection	Housing	IP 50
	Terminal block	IP 20
Flame resistance	°C	850 conforming to UL, IEC 60695-2-1
Shock resistance		50 gn/11 ms conforming to IEC 68-2-27
Vibration resistance		5 gn (10...100 Hz) conforming to IEC 68-2-6
Immunity to EMC	Resistance to electrostatic discharge	kV Level 3: 8 (air), 6 (contact) conforming to IEC 1000-4-2
	Immunity to fast transient currents	kV On the power supply: 2; on the input-output: 1 conforming to IEC 1004-4
	Surge withstand	kV 0.5 - waves 1.2/50 µs; 0.5 J conforming to IEC 1000-4-5
Disturbance	Radiated/conducted	CISPR11 and CISPR22 Group 1- Class B
Insulation voltage	kV	2
Ambient air temperature around the device		
	Storage	°C -40...85 (-40...185 °F)
	Operation	°C Mounted side-by-side: 0...50 (32...122 °F); 2 cm spacing: 0...60 (32...140 °F)
Degree of pollution		2 conforming to IEC 60664-1
Mounting		35 mm DIN rail, clip-on or fixed on mounting plate
Connection	mm²	2 x 1.5 or 1 x 2.5 cable
Tightening torque	Nm	0.6...1.1

Specific characteristics

Types of converter for thermocouples		RMT J40BD	RMT J60BD	RMT J80BD	RMT K80BD	RMT K90BD
Input types	Thermocouple type to IEC 60584	J (Fe-CuNi)			K (Ni-CrNi)	
	Temperature range	°C 0...150	0...300	0...600	0...600	0...1200
		°F 32...302	32...572	32...1112	32...1112	32...2192
Analogue output switchable to voltage or current						
Voltage	Range	V	0...10			
	Minimum impedance of load	kΩ	100			
Current	Range	mA	0...20 ; 4...20			
	Maximum impedance of load	Ω	500			
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit			
Safety	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage = - 13 V current = 0 mA			
Supply						
Voltage	Rated	V	24 ± 20 %, non isolated			
Maximum current consumption	For voltage output	mA	40			
	For current output	mA	60			
Built-in protection			Reverse polarity			
Signalling			Green LED (power on)			
Measurements						
Accuracy	At 20 °C	%	± 1 of the full scale value ± 10 of the full-scale value (in an environment subject to electromagnetic interference of 10 V/m)			
	At 20 °C	%	± 0.25 of the full scale value			
Repeat accuracy	At 20 °C	%	± 0.8 of the full scale value			
	At 60 °C	%	± 0.8 of the full scale value			
Temperature coefficient		ppm/°C	200 (0.02 %)			
Cold junction compensation			Built-in, cold junction measurement: 0 to 60 °C (0...140 °F)			

Specific characteristics (continued)

Types of converter for Pt100 probes			RMP T10/13BD	RMP T20/23BD	RMP T30/33BD	RMP T50/53BD	RMP T70/73BD
Input types	Probe type		Pt100 - IEC 60751; DIN 43760 (2, 3, 4-wire)				
	Temperature range	°C	- 40...40	- 100...100	0...100	0...250	0...500
		°F	- 40...104	- 148...212	32...212	32...482	32...932
Analogue output			0...10 V/0...20 mA, 4...20 mA switchable for RMP T●0BD				
Output selection			0...10 V or 4...20 mA for RMP T●3BD				
Voltage	Minimum impedance of load	kΩ	100				
Current	Maximum impedance of load	Ω	500				
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit				
Safety	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage = - 13 V current = 0 mA				
Supply							
Voltage	Rated	--- V	24 ± 20 %, non isolated				
Maximum current consumption	For voltage output	mA	40				
	For current output	mA	60				
Built-in protection			Reverse polarity				
Signalling			Green LED (power on)				
Measurements							
Accuracy	At 20 °C	%	± 0.5 (3, 4-wire connection) of the full scale value ± 1 (2-wire connection) of the full scale value ± 10 of the full-scale value (in an environment subject to electromagnetic interference of 10 V/m)				
	At 20 °C	%	± 0.2 of the full scale value				
	At 60 °C	%	± 0.6 of the full scale value				
Temperature coefficient		ppm/°C	150 (0.015 %)				
Connection in 2-wire mode							
	Maximum resistance of cable	mΩ	200				

Specific characteristics

Types of voltage/current converters			RMC N22BD	RMC L55BD	RMC V60BD	RMC A61BD
Input types	Voltage	V	≡ 0...10	≡ 0...10, ±10	0...50; 0...300; 0...500 ≡ or ~ 50/60 Hz	—
	Current	mA	4...20	0...20 ; 4...20	—	—
		A	—	—	—	0...1.5; 0...5; 0...15 ≡ or ~ 50/60 Hz
Analogue output						
Output selection			By cabling	Switchable	Switchable	By cabling
Voltage	Range	V	0...10	0...10; ± 10	0...10	0...10
	Minimum impedance of load	kΩ	100			
Current	Range	mA	4...20	0...20; 4...20	0...20; 4...20	0...20 4...20
	Maximum impedance of load	Ω	500			
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit			
Safety	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage: < 0 V current: < 4 mA voltage: - 10...+ 10 V : -10 V current: 0...+ 10 V : 0 V current: 0...20 mA : 0 mA 4...20 mA : 4 mA voltage: < 0 V current: 0...20 mA : 0 mA 4...20 mA : < 4 mA			
Supply						
Voltage	Rated	V	≡ 24 ± 20 % non isolated	≡ 24 ± 20 % isolated (1.5 kV)		
Maximum current consumption	For voltage output	mA	40	70		
	For current output	mA	60	90		
Built-in protection			Reverse polarity			
Signalling			Green LED (power on)			
Measurements						
Accuracy	At 20 °C	%	± 1 of the full scale value ± 10 of the full-scale value (in an environment subject to electromagnetic interference of 10 V/m)			± 5 of the full scale value ± 10 of the full-scale value (in an environment subject to electromagnetic interference of 10 V/m)
Repeat accuracy	At 20 °C	%	± 0.2 of the full scale value			
	At 60 °C	%	± 0.6 of the full scale value			
Temperature coefficient		ppm/°C	200 (0.02 %)			0...1.5 A: 500 (0.05 %) 0...5 A: 1000 (0.1 %) 0...15 A: 2000 (0.2 %)

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes

Voltage/current converters



RMT J40BD



RMT K90BD



RMP T70BD



RMP T13BD



RMC N22BD



RMC L55BD



RMC A61BD

Converters for J and K type thermocouples

Supply voltage $\pm 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Switchable output signal	Reference	Weight kg
	$^{\circ}\text{C}$	$^{\circ}\text{F}$			
Type J	0...150	32...302	0...10 V, 0...20 mA, 4...20 mA	RMT J40BD	0.120
	0...300	32...572	0...10 V, 0...20 mA, 4...20 mA	RMT J60BD	0.120
	0...600	32...1112	0...10 V, 0...20 mA, 4...20 mA	RMT J80BD	0.120
Type K	0...600	32...1112	0...10 V, 0...20 mA, 4...20 mA	RMT K80BD	0.120
	0...1200	32...2192	0...10 V, 0...20 mA, 4...20 mA	RMT K90BD	0.120

Converters for Universal Pt100 probes

Supply voltage $\pm 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Switchable output signal	Reference	Weight kg
	$^{\circ}\text{C}$	$^{\circ}\text{F}$			
Pt100 2-wire, 3-wire and 4-wire	-40...40	-40...104	0...10 V, 0...20 mA, 4...20 mA	RMP T10BD	0.120
	-100...100	-148...212	0...10 V, 0...20 mA, 4...20 mA	RMP T20BD	0.120
	0...100	32...212	0...10 V, 0...20 mA, 4...20 mA	RMP T30BD	0.120
	0...250	32...482	0...10 V, 0...20 mA, 4...20 mA	RMP T50BD	0.120
	0...500	32...932	0...10 V, 0...20 mA, 4...20 mA	RMP T70BD	0.120

Converters for Optimum Pt100 probes (1)

Supply voltage $\pm 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Output signal	Reference	Weight kg
	$^{\circ}\text{C}$	$^{\circ}\text{F}$			
Pt100 2-wire, 3-wire and 4-wire	-40...40	-40...104	0...10 V or 4...20 mA	RMP T13BD	0.120
	-100...100	-148...212	0...10 V or 4...20 mA	RMP T23BD	0.120
	0...100	32...212	0...10 V or 4...20 mA	RMP T33BD	0.120
	0...250	32...482	0...10 V or 4...20 mA	RMP T53BD	0.120
	0...500	32...932	0...10 V or 4...20 mA	RMP T73BD	0.120

Universal voltage/current converters

Supply voltage $\pm 24\text{ V} \pm 20\%$, non isolated

Input signal	Output signal	Reference	Weight kg
0...10 V or 4...20 mA	0...10 V or 4...20 mA	RMC N22BD	0.120

Supply voltage $\pm 24\text{ V} \pm 20\%$, isolated

Input signal	Output signal	Reference	Weight kg
0...10 V, $\pm 10\text{ V}$, 0...20 mA, 4...20 mA	Switchable: 0...10 V, $\pm 10\text{ V}$, 0...20 mA, 4...20 mA	RMC L55BD	0.120
0...50 V, 0...300 V, 0...500 V \pm or \sim 50/60 Hz	Switchable: 0...10 V, 0...20 mA, 4...20 mA	RMC V60BD	0.150
0...1.5 A, 0...5 A, 0...15 A \pm or \sim 50/60 Hz	0...10 V or 0...20 mA or 4...20 mA	RMC A61BD	0.150

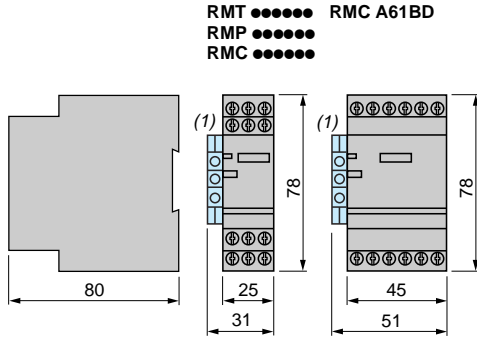
Connection accessories

Description	Type	Sold in lots of	Unit reference	Weight kg
Terminal blocks for connection of protective earth conductor	Screw	100	AB1 RRTP435U	0.025
	Spring	100	AB1 RRTP435U2	0.015

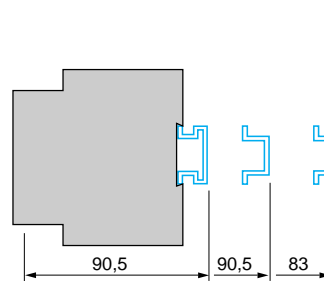
(1) Converters dedicated to Zelio Logic smart relays.

Dimensions, mounting

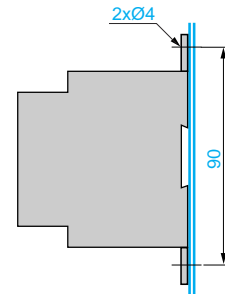
RMT ●●●●●/RMP ●●●●●/RMC ●●●●●



Mounting on rails AM1 ●●●●●



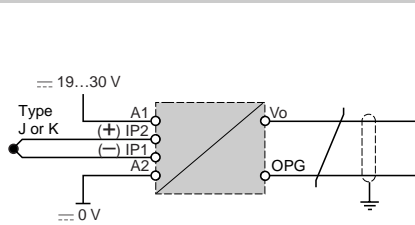
Panel mounting



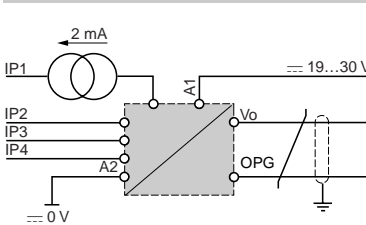
(1) Terminal block AB1 RRTP435U or AB1 RRTP435U2.

Schemes

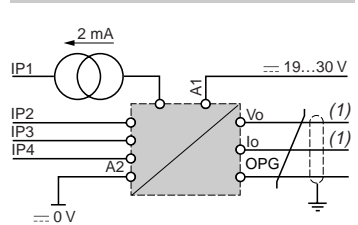
RMT J●●●●, RMT K●●●●



RMP T●0BD



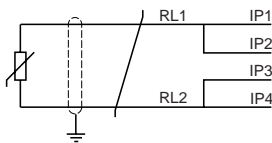
RMP T●3BD



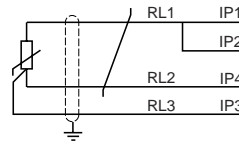
(1) Use one output only.

Input connections on RMP T●●●●

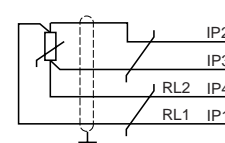
2-wire type
 $RL1 + RL2 \leq 200 \text{ m}\Omega$



3-wire type
 $RL1 = RL2 = RL3$
 $RL1 + RL2 \leq 200 \text{ }\Omega$

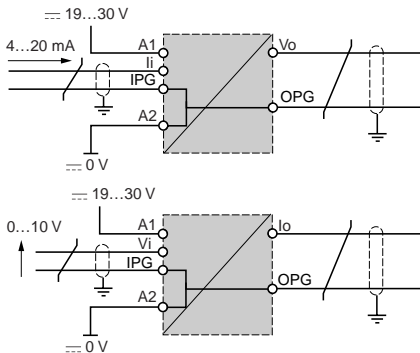


4-wire type
 $RL1 + RL2 \leq 200 \text{ }\Omega$

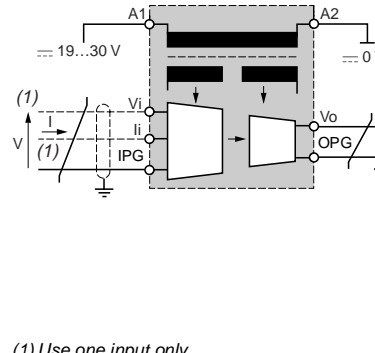


RMC ●●●●●

RMC N22BD

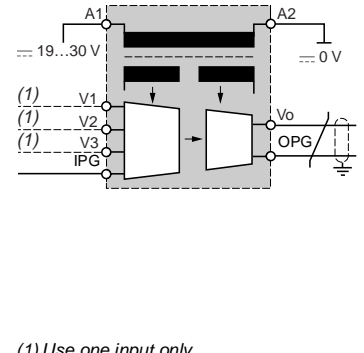


RMC L55BD



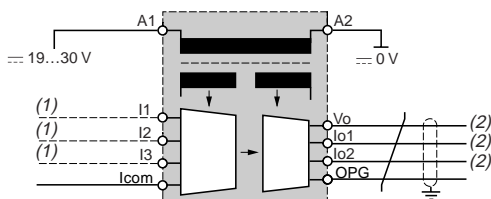
(1) Use one input only.

RMC V60BD



(1) Use one input only.

RMC A61BD



(1) Use one input only.
(2) Use one output only.

⚠ The input, output and power supply lines must be kept away from the power cables to avoid effects due to induced interference. The input and output cables must be shielded as indicated in the schemes and must be kept away from each other.

Power supplies and transformers

Power supplies for d.c. control circuits

Phaseo modular regulated power supplies

Modular switch mode power supplies ABL 7RM

The ABL 7RM range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of automation system equipment. Comprising 3 products, this range meets the needs encountered in industrial, commercial and residential applications. These single-phase, modular, electronic switch mode power supplies provide a quality of output current which is suitable for the loads supplied and compatible with the Zelio Logic range, making them ideal partners. Clear guidelines are given on selecting the upstream protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

These switch mode power supplies are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies, which offer:

- very compact size,
- integrated overload, short-circuit, overvoltage and undervoltage protection,
- a very wide range of permissible input voltages, without any adjustment,
- a high degree of output voltage stability,
- good performance,
- considerably reduced weight,
- a modular format allowing integration into panels.

Phaseo power supplies are single-phase. They deliver a voltage which is precise to 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase. Conforming to IEC standards and UL and CSA certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.

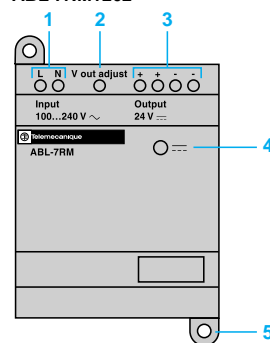
All the products are fitted with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs. These power supplies are designed for direct mounting on 35 and 75 mm $\bar{\text{U}}$ rails, or on a mounting plate using the retractable fixing lugs.

These power supplies are single-phase and three references are available:

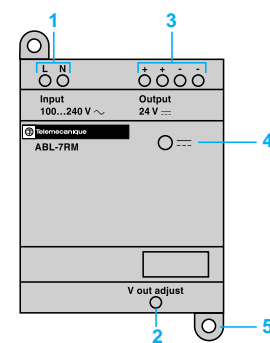
- ABL 7RM2401 (24 V $\bar{\text{U}}$ /1.3 A),
- ABL 7RM24025 (24 V $\bar{\text{U}}$ /2.5 A),
- ABL 7RM1202 (12 V $\bar{\text{U}}$ /1.9 A).

Description

ABL 7RM2401
ABL 7RM1202



ABL 7RM24025



- 1 2.5 mm² screw terminals for connection of the incoming a.c. supply voltage.
- 2 Output voltage adjustment potentiometer.
- 3 2.5 mm² screw terminals for connection of the output voltage.
- 4 LED indicating presence of the d.c. output voltage.
- 5 Retractable fixing lugs.

Technical characteristics

Power supply type		ABL 7RM1202	ABL 7RM2401	ABL 7RM24025
Certifications		UL - CSA - TÜV		
Conforming to standards	Safety	IEC/EN 60950-1 - IEC/EN 61131-2/A11		IEC/EN 60950-1
	EMC	IEC/EN 61000-6-2 (IEC/EN 61000-6-1), IEC/EN 61000-6-3		

Input circuit

LED indication		No		
Input voltage	Nominal values	V	~ 100...240	
	Permissible values	V	~ 85...264	
	Permissible frequencies	Hz	47...63	
	Efficiency at nominal load		> 80%	
	Current consumption	A	0.5 (100 V)/0.3 (240 V)	0.6 (100 V)/0.4 (240 V)
	Current at switch-on	A	< 20	
	Power factor		< 90 for 1 ms	

Output circuit

LED indication		Green LED		
Nominal output voltage		V	12	24
Nominal output current		A	1.9	1.3
Precision	Output voltage		Adjustable from 100 to 120%	
	Line and load regulation		± 4 %	± 3 %
	Residual ripple - interference	mV	200	250
Micro-breaks	Holding time for I max and Ue min	ms	> 10	
Protection	Against short-circuits		Permanent/Thermal protection	
	Against overcurrent, cold state		< 1.7 In	< 1.6 In
	Against overvoltage	V	< 10.5	< 19

Operating characteristics

Connections	Input	mm ²	1 x 2.5 or 2 x 1.5 screw terminals	
	Output	mm ²	1 x 2.5 or 2 x 1.5 screw terminals	
Environment	Storage temperature	°C	- 25...+ 70	
	Operating temperature	°C	- 20...+ 55	
	Maximum relative humidity		95 %	
	Degree of protection		IP 20	
	Vibration		IEC/EN 61131-2, IEC/EN 60068-2-6 test Fc	
Operating position			Vertical	
Connections	Series		No	
	Parallel		Yes (same references)	
Dielectric strength			3000 VAC/50 Hz/1 min	
Protection class conforming to VDE 0106 1			Class II without PE	
Input fuse incorporated			Yes (not interchangeable)	
Emissions			IEC/EN 61000-6-3, EN 55011, EN 55022 Cl:B	
Immunity	Electrostatic discharge		IEC/EN 61000-6-2 (generic standard), IEC/EN 61000-4-2 (4 kV contact/8 kV air)	
	Electromagnetic		IEC/EN 61000-4-3 level 3 (10 V/m)	
	Conducted interference		IEC/EN 61000-4-4 level 3 (2 kV), IEC/EN 61000-4-6 (10 V)	
	Mains interference		IEC/EN 61000-4-11	

Output characteristics

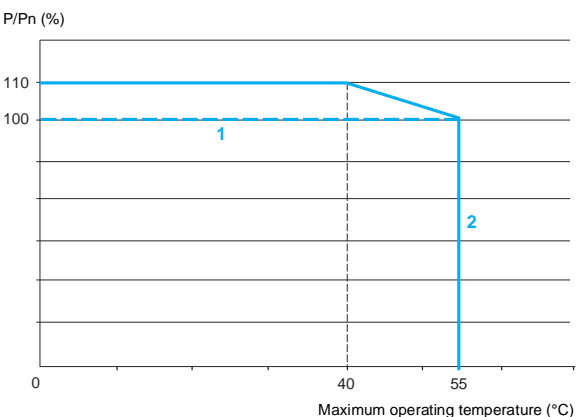
Exceeding the nominal power (only applicable to ABL 7RM1202 and ABL 7RM2401)

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. Conversely, a power supply can deliver more than its nominal power if the ambient temperature remains well below the nominal operating temperature.

The maximum ambient temperature for Phaseo power supplies is 55 °C. Below this temperature, uprating is possible up to 110% of the nominal power.

The graph below shows the power (in relation to the nominal power) that the power supply can deliver continuously, according to the ambient temperature.

Power supply ABL 7RM24025 cannot exceed the nominal power of 60 W.



1 ABL 7RM24025

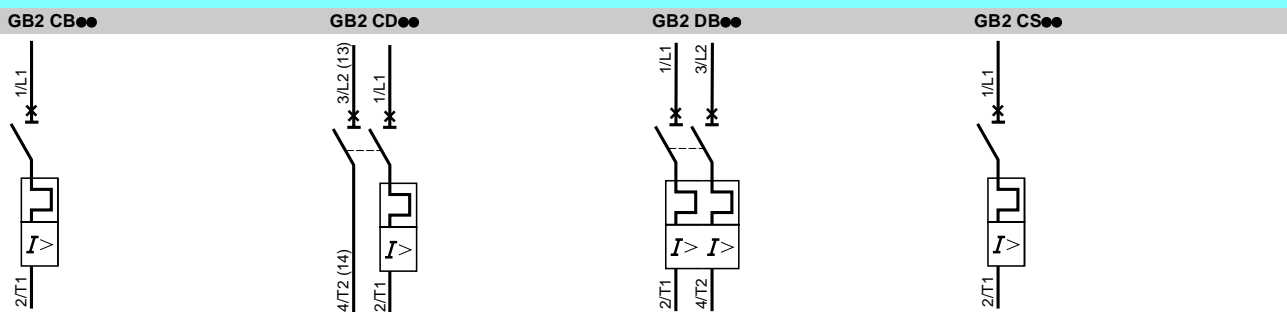
2 ABL 7RM1202 and ABL 7RM2401

Selection

Upstream protection of power supplies

Type of mains supply	~ 100 V single-phase			~ 240 V single-phase		
	Thermal-magnetic circuit-breaker		Fuse gG	Thermal-magnetic circuit-breaker		Fuse, gG
	GB2 (UL/IEC)	C60N (IEC) C60N (UL)		GB2 (UL/IEC)	C60N (IEC) C60N (UL)	
ABL 7RM1202	GB2 ●●06	24580 24516	1 A	GB2 ●●05	24494 24516	1 A
ABL 7RM2401	GB2 ●●06	24580 24516	1 A	GB2 ●●06	24580 24516	1 A
ABL 7RM24025	GB2 ●●08	24582 24518	3 A	GB2 ●●08	24582 24518	3 A

Schemes



Power supplies and transformers

Power supplies for d.c. control circuits
Phaseo modular regulated power supplies

Modular regulated switch mode power supplies ABL 7RM (1)



ABL 7RM

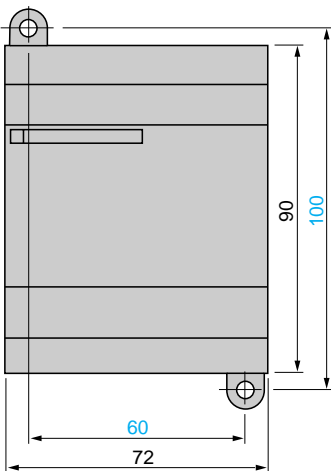
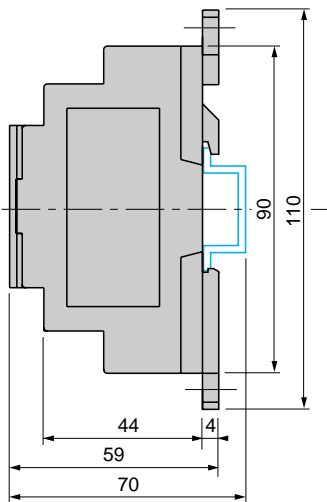
Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Reference	Weight
V	≡ V	W	A			kg
100...240 Single-phase wide range	12	22	1.9	Auto	ABL 7RM1202	0.180
	24	30	1.3	Auto	ABL 7RM2401	0.182
		60	2.5	Auto	ABL 7RM24025 ▲	0.255

▲ Available
1st quarter 2006.

(1) For additional products, please refer to our "Interfaces, I/O splitter boxes and power supplies" catalogue.

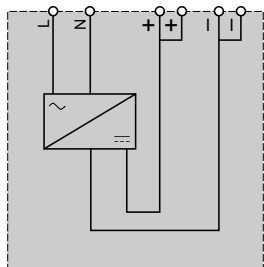
Dimensions

Power supply ABL 7RM●●●●



Scheme

ABL 7RM●●●●



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